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 UNIVERSITY STUDY IN NAVAL ARCHITECTURE

Split, June 2017

CONTENTS

GENERAL INFORMATION OF HIGHER EDUCATION INSTITUTION

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

Name of the study programme	UNDERGRADUATE UNIVERSITY 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	University Bachelor of Naval Architecture; univ. 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 university study in Naval Architecture was developed in order to enable students to acquire basic theoretical knowledge and practical expertise, and to train 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 university 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 attending a study programme in Naval Architecture find a job immediately after graduation, and are often employed by various companies already during their study. Almost all of those who do not get a job immediately after graduation continue their education at graduate study in Naval Construction at FSB in Zagreb or at the Faculty of Engineering in Rijeka. 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. Students have expressed a special interest for the field of small shipbuilding regularly taking elective courses that are associated with this industry.

Development strategy of Split-Dalmatia County emphasizes a need to create measures for the preservation of existing industry and to encourage bringing new large investors, especially in the field of shipbuilding. According to GVA (that records above-average shares in the relation to the share of the county in the total GVA in manufacturing industry), one of the most important activities in the manufacturing industry is construction of ships and boats, with a share of 6.2% in GVA (cumulative share of 81,0%, and the share in BDV at the national level 11.3%). The Strategy adds that “it should be considered that a significant part of Gross Value Added in other branches of industry (production of plastics, fishing, etc.) is related to the shipbuilding industry. For this reason its multiplier effect is much bigger than just share in GVA”. As far as number of employees is concerned, one of the most important activities is the production of ships

and boats with 4475 employees and with a share of 24.9% in the total number of employees in the county. SWOT analysis presented in the Strategy emphasizes the following opportunity: “there is increasing demand for specialized types of ships and our shipyards, due to their quality, have advantages over the competition (eco-boats, large fishing boats, etc.)”. The same analysis defines the threat: “Non-compliance of education programmes with the needs of the labour market (lack of certain programmes and insufficient quality of existing programmes)”. The strategy recognizes a development problem as well, “except in the area of the ship export, the county economy records insignificant value of exports of medium and high level technology products”. Furthermore, strategy recognizes a need to “encourage development of clusters through county programmes or to functionally link business entities and establish cooperation with scientific research institutions”.

Competitive economy represents a major strategic objective for the county, and its priority is to create a competitive knowledge-based economy. One of the necessary measures is the development of clusters, among others Shipbuilding Cluster. There are three registered clusters in the county area. Shipbuilding Cluster of Split-Dalmatia County, founded in 2007 in Split, has 43 business, research, development, design and scientific entities that employ approximately 7300 employees. The second strategic objective, the human resource development and increasing the quality of life, relates to the harmonization of educational programmes and the needs of the economy together with the expected result of models that encourage students to enrol study programmes related to the natural and engineering sciences. Therefore, the aim of the proposed undergraduate university study in Naval Architecture is to train professionals in the field of Naval Architecture for the needs of the economy, governmental and other public institutions

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. Furthermore, it implements joint projects with a number of private enterprises and public organisations such as: Brodosplit, Brodotrogir, Technology centre Split, Adriawinch, AD boats, Adria-Mar, Croatian register of shipping, Damor, Monachus, Adriaprop, 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, Siemens, VIPnet, Microsoft Croatia etc.

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 university study in Naval Architecture is organized according to the Bologna principles and it has three phases: undergraduate, graduate and postgraduate, all evaluated by the ECTS credit system. FESB students can currently enrol only undergraduate study programme. However, above mentioned structure and ECTS credit system, enable them to continue their education at graduate study in Naval Architecture at other universities in Croatia, as well as in 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 undergraduate study in Naval Architecture was given. Proposed study programme offers, in the first two years, basic science courses, basic engineering courses and several non- engineering courses as well as few introductory specialised courses related in naval architecture. The majority of the courses at the third year are specialised courses in naval architecture. Students have the opportunity to choose two courses and a final thesis. The structure of the proposed study programme is comparable with similar studies on related study programmes in Naval Architecture in Rijeka that also lasts for 6 semesters. As far as foreign universities are concerned, the programme is comparable to the programme of the University of Southampton, United Kingdom. Due to its content and competencies, as well as the application of modern teaching methods, the programme is comparable with study programmes in Naval Architecture at renowned European universities:

- RITEH, Croatia. www.riteh.hr
- University of Southampton (Great Britain). http://www.southampton.ac.uk

As far as elective courses are concerned, they are mostly aimed at design and production of modern small light boats built of composite materials what makes study programme comparable with the well-known study programmes in Naval Architecture “Ship Science / Yacht Design” and Small Craft at the University of Southampton:

(http://www.southampton.ac.uk/engineering/undergraduate/courses/maritime_engineering/j643_meng_ship_science_yacht_and_small_craft.page.)

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 university 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 university 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 linked directly with the learning outcomes of individual courses and represent learning outcomes achieved by every student who has completed undergraduate university study in Naval Architecture. The learning outcomes are in line with the Law on the Croatian Qualification Framework and are listed as common learning outcomes for both fields of study and additional learning outcomes depending on the selected field of study and based on competencies, skills and corresponding independence and responsibility:

KNOWLEDGE AND UNDERSTANDING

1. Know and apply basic terminology related to Naval Architecture in Croatian and English language.
2. Demonstrate wide knowledge and understanding of the theory of Naval Architecture.
3. Calculate fundamental measures and quantities and terms in Mechanics (force, moment of force, couple, moment of couple, force system, link, link reaction, external forces, internal forces).
4. Apply basic concepts related to the motion of objects.
5. Have basic knowledge of structural analysis and ship construction.
6. Know mechanical properties of materials and their relationship with the structure of materials; have practical knowledge regarding requirements, peculiarities and characteristics of the most commonly used materials for shipbuilding and marine applications, and related production methods.
7. Use the rules of classification societies for dimensioning of ship structure components.

8. Calculate buoyancy and stability of undamaged ships for the default loading conditions and use the rules of classification societies for evaluating stability of undamaged ship.
9. Show and explain physical characteristics of fluid flow.
10. Classify and consider the fundamental thermodynamic concepts, thermodynamic external influence and state variable; bring them into physical connection with the change of state of a substance or system.
11. Apply relevant mathematical and engineering methods for formulating and solving engineering problems in the shipbuilding industry.
12. Develop ability of independent development of project documentation in the field of mechanical engineering and naval architecture by applying standard procedure and by using a computer.
13. Analyse and solve problems regarding vessel design and marine facilities.
14. Enumerate and describe technologies for metal casting, deforming, forming, joining and separating; describe possibilities of applicability of these processes in production.
15. Describe and explain features of the shipbuilding production process, from input material storage to the ship launching. Attach documentation that is required in order to build the ship.
16. Identify, locate and provide the necessary information.
17. Identify non-technical effects of engineering activities and integrate them into the work activities in a responsible manner.

SKILLS (cognitive, practical, social)

18. Ability to plan, organize and carry out advanced tasks within specified parameters by applying the appropriate methods and tools; evaluate the work.
19. Ability to analyse and evaluate complex phenomena and problems
20. Ability to manage complex and changing environmental conditions and to make decisions regarding their changing by developing and producing complex methods
21. Ability to imagine, create and manage small boats and floating structures
22. Ability to evaluate the effectiveness of the experiment in order to solve the problem.
23. Ability to engage in teamwork and contribute to teamwork in different groups and under unpredictable conditions
24. Ability to analyse and discuss conclusions of completed tasks.
25. Ability to predict and make decisions regarding complex issues in the main field of study, taking into consideration relevant scientific, economic, social, environmental and ethical aspects.
26. Ability to manage projects in the field of shipbuilding,
27. Ability to effectively use different methods in order to communicate with the engineering community and society as a whole, in the national and international context, with different social and professional groups.

RESPONSIBILITY

28. Ability to take personal and team responsibility for made decisions and successful implementation and execution of tasks, taking into account scientific, social, economic, environmental and ethical aspects of the problem.
29. Ability to identify the possibilities and limitations of science and technology as well as future needs for knowledge in the field of shipbuilding; to take responsibility for the continuous improving of personal knowledge and skills.
30. Demonstrate professional and ethical responsibility under unpredictable conditions.

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 university 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 university 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 undergraduate university study in Naval Architecture students can continue their education at graduate study in Naval Architecture at FESB, at 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 lover 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 university study in Naval Architecture at FESB in Split.

2.6. Structure of the study

Study programme lasts 6 semesters, there are two semesters per academic year. Each semester is worth 30 ECTS credits.
Undergraduate university study programme in Naval Architecture is completed after the final thesis is completed and defended. Enrolment requirements are shown in tables for each course. Lectures are delivered in groups of 100 students, auditory exercises and seminars in groups of 30 students, laboratory exercises in groups of 10 students.

2.7. Guiding and tutoring through the study system

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

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

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

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

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

2.10. Criteria and conditions for transferring the ECTS credits

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

2.11. Completion of study

Final requirement for completion of study	Final thesis ☒ Diploma thesis ☐	Final exam ☐ Diploma exam ☐
Requirements for final/diploma thesis or final/diploma/exam	The requirement for applying for the 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	FEMX01	Mathematics 1	45	0	45	0	0	7
	FESC02	Mechanics 1	45	0	45	0	0	7
	FETD07	Materials 1	45	0	0	15	0	5
	FESD01	Ship Geometry	30	0	0	30	0	5
	FESC19	Engineering Graphics 1	15	0	0	0	30	4
	FEOD02	English Language 1	0	30	0	0	0	2
	Total		180	30	90	45	30	30
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
	There are no elective courses.							

List of courses								
Year of study: 1.								
Semester: II.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FEMX02	Mathematics 2	45	0	45	0	0	7
	FESC05	Mechanics of Materials 1	45	0	30	0	0	6
	FETD03	Shipbuilding Materials	30	0	0	30	0	5
	FESC21	Mechanics 2	30	0	30	0	0	5
	FESC20	Engineering Graphics 2	30	0	0	0	30	4
	FEOD03	English Language 2	0	30	0	0	0	3
	Total		180	30	105	30	30	30
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
	There are no elective courses.							

List of courses								
Year of study: 2.								
Semester: III.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FESC04	Mechanics 3	45	0	15	15	0	7
	FESD02	Introduction to Thermodynamics	45	0	30	0	0	7
	FEMC02	Mathematics 3	30	0	30	0	0	6
	FESC23	Computer Aided Design	30	0	0	0	30	5
	FESC08	Mechanics of Materials 2	30	0	30	0	0	5
	Total		180	0	105	15	30	30
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
	There are no elective courses.							

List of courses								
Year of study: 2.								
Semester: IV.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FETD04	Fundamentals of Manufacturing Processes	45	0	0	15	0	6
	FESD11	Fluid Mechanics	45	0	30	0	0	6
	FESD09	Ship Hydrostatics and Stability	45	0	30	0	0	6
	FESD06	Machine Elements	30	0	0	0	30	5
	FEMX04	Probability and Statistics	30	0	30	0	0	5
	FESD10	Ship Equipment	30	0	0	0	0	2
	Total		225	0	90	15	30	30
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
	There are no elective courses.							

List of courses								
Year of study: 3.								
Semester: V.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FESD07	Ship Resistance and Propulsion	45	0	30	15	0	7
	FESD05	Ship Structural Design	45	0	45	0	0	7
	FESC22	Computer-Aided Analysis	30	0	0	30	0	5
	FESD23	Project	0	15	0	0	30	5
	FENC01	Electrical Engineering and Electronics	30	0	15	15	0	4
	FEOB02	Communication Skills	0	30	0	0	0	2
	Total		150	45	90	60	30	30
	L = Lectures, S = Seminar, AE = Auditory Exercises, LE = Laboratory Exercises, DE = Design Exercises							
	There are no elective courses.							

List of courses								
Year of study: 3.								
Semester: VI.								
STATUS	CODE	COURSE	HOURS IN SEMESTER					ECTS
			L	S	AE	LE	DE	
Mandatory	FESD12	Shipbuilding Technology	45	0	15	30	0	7
	FETD06	Shipyard Organization and Management	30	0	30	0	0	5
		Elective Course 1						
		Elective Course 2						
	FEXX01	Final Thesis						12
	Total		75	0	45	30	0	24
Elective	FESD14	Small Ships Propulsion	30	0	15	0	0	3
	FESD15	Marine Machinery And Devices	30	0	15	0	0	3
	FETD05	Welding in Shipbuilding	30	0	0	15	0	3
	FESD16	Numerical Methods in Shipbuilding	45	0	0	0	0	3
	FESD19	Marine Floating Objects	30	0	15	0	0	3
	FESR16	Noise And Vibration Control	30	0	15	15	0	5
	FEOC05	Communication Skills In English	0	30	0	0	0	4
	FEOC04	Introduction To Public Speaking	0	30	0	0	0	4
	FEND02	Electrical Drives	30	0	15	15	0	4
	FEXX06	Professional Training	0	0	0	0	0	5
	Two elective courses are chosen.							

2.13. Course description

NAME OF THE COURSE	COMMUNICATION SKILLS					
Code	FEOA03	Year of study	1			
Course teacher	Mirjana M. Kovač Ph.D., Assistant Professor	Credits (ECTS)	3			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			0	30	0	0
Status of the course	Mandatory	Percentage of application of e-learning				

COURSE DESCRIPTION

Course objectives	• understand the basic concepts related to verbal and nonverbal communication, as well as the factors that influence these concepts; • develop the skills of presentation planning, presentation structure, and presentation performance in the Croatian language; • develop pragmatic language competence; • adopt the basic principles of written communication.	
Course enrolment requirements and entry competences required for the course	None.	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. describe the theories and models of communication; 2. employ active listening techniques; 3. demonstrate questioning skills; 4. give a technical presentation; 5. critically evaluate their own communication skills; 6. recognize disfluent speech; 7. negotiate and demonstrate the skills of assertive communication.	
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L/S
	Definitions of communication; Overview of the theory of communication; Cross-cultural communication	0/2
	Verbal and nonverbal communication	0/2
	Questioning as a communication skill	0/2
	Active listening and Barriers to active listening	0/2
	Persuasion skills	0/2
	Written communication; Project reports	0/2
	Presentation skills (systematic guide)	0/2
	Technical presentation	0/2
	Technical presentation and peer evaluation	0/2
	Assertive communication and Critical thinking	0/2
	Public speaking skills	0/2
	Types of speech disfluencies	0/2
	Group and Team communication	0/2
Format of instruction	☐ lectures ☒ seminars and workshops ☐ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☒ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☐ (other)

<table>
<tr><td>Student responsibilities</td><td colspan="6">Active participation in all activities: lectures, consultations, searching the literature, individual work.</td></tr>
<tr><td rowspan="6">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td>1,1</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>1,1</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td>0,5</td><td>(Other)</td><td></td></tr>
<tr><td>Midterm exam</td><td>0,2</td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>0,1</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">The final grade is determined as the average of:
• assessment of oral presentation and peer assessment of oral presentation;
• assessment of written communication skills,
written and oral assessment.

There are two midterm exams and two examination periods. The first midterm exam is after 7 weeks of lecturing, and the second one is after the next 6 weeks. The lowest passing point is 50% in each midterm exam. The students who do not pass the midterm exams write the exams. The final grade for the course is calculated as a percentage of points earned. The final grade is determined applying the absolute ECTS grading system in accordance with the Rules of the Studying System of the University of Split.
At the end of the semester the grades are averaged to form a grade Point Average, according to this scale:

50% - 61% - sufficient (2),
62% - 74%- good (3),
75% - 87% - very good (4),
88% - 100% - excellent (5).

Students who fail the two exams in the first examination period take the exam in the autumn final examination period. The final exam consists of the material covered in both midterm exams.</td></tr>
<tr><td rowspan="2">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">- Kovač, M.M., Sirković, N.: Presentation, Writing and Interpersonal Communication Skills. FESB, 2014.</td><td>20</td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">Davies, J. W.: Communication skills: A Guide for Engineering and Applied Science Students. Pearson: Prentice Hall, 2001

Harris, T. E., Sherblom, J.C.: Small Group and Team Communication. Pearson Education/Allyn & Bacon, 2010.Press/Wiley, 2003</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	COMMUNICATION SKILLS IN ENGLISH						
Code	FEOC05	Year of study	3.				
Course teacher	Mirjana M. Kovač, Ph.D., Assistant Professor Nina Sirković, Ph.D., Assistant Professor	Credits (ECTS)	4				
Associate teachers	-	Type of instruction (number of hours)	L	S	AE	LE	DE
			0	30	0	0	0
Status of the course	Optional	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - Development of students' oral and written communication skills in English - Leading of formal and informal communication as well as team communication - 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: - Prepare and hold a professional presentation in English - Implement rules for writing professional papers as well as for formal writing in general - Use phrasal expressions to improve English language knowledge - Lead a formal professional conversation - Actively participate in an international team as well as in formal meetings		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	S hours	AE hours
	Course introduction: presentation skills, written and interpersonal communication	2	
	Presentation planning: mind maps and the pyramid principle	2	
	Presentation structure, verbal, vocal and nonverbal presentation skills	2	
	Technical presentation: organisation and performance	2	
	Presentations: peer assessment	6	
	First midterm exam		
	Written communication: writing seminar, final, professional and scientific paper	2	
	Technical paper structure	2	
	Scientific style used in technical writing	2	
	Business communication skills: socialisation and interpersonal communication	2	
	Formal and informal communication	2	
	Team communication	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	1
	Essay		Seminar essay		Presentation	1
	Tests	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 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. Grade (in percentage) is formed according to the score: 88-100% - excellent (5) 75-87% - very good (4) 62-74% - good (3) 50-61% - sufficient (2). Midterm and final exams are carried out according to the academic year calendar.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Kovač M. M., Sirković, N. (2014). Presentation, Writing and Interpersonal Communication Skills. Split. FESB.	10	
	Barker, A. (2010). Improve your communication skills. London and Philadelphia. Kogan page.		

Optional literature (at the time of submission of study programme proposal)	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	COMPUTER- AIDED ANALYSIS						
Code	FESC22	Year of study	2				
Course teacher	Damir Vučina, Ph.D.,Full Professor	Credits (ECTS)	5				
Associate teachers	Igor Pehnec, Ph.D., Asistant Professor Ivo Marinić- Kragić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	30	0
Status of the course	Obligatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Acquiring theoretical know-how in basic numerical methods in engineering. Developing competences in modeling engineering problems for numerical methods. Developing practical skills in developing C and Matlab code for engineering problems.		
Course enrolment requirements and entry competences required for the course	Competences acquired in courses Mathematics I, Mechanics I		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After completing the course, students will be able to: • Explain the basic setup of computers, • Describe the procedure of developing programs, • C language: characterize the properties of syntax elements • Categorize the properties of numerical procedures • Develop flowcharts for simpler problems • Numerically model simpler engineering problems • Create and apply basic methods of numerical analysis for: solving linear systems, nonlinear equations, integration, differentiation, interpolation, approximation • Develop and test own programs in C		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Introduction to computers, binary system, logic functions. Introduction to computer-aided analysis.	2	
	Basics of numerical procedures and analysis, simple algorithms.	2	
	C-language programming part 1	2	
	C-language programming part 2	2	
	Developing flowcharts and pseudo-code, part 1	2	
	Developing flowcharts and pseudo-code, part 2	2	
	Elementary numerical procedures and engineering applications (mechanics, fluid mechanics, thermodynamics)	2	
	Engineering application of numerical methods: Solving linear systems	2	
	Engineering application of numerical methods: Solving nonlinear equations and systems.	2	
	Engineering application of numerical methods: Interpolation by polinomials and piecewise polynomials	2	
	First midterm exam		
	Engineering application of numerical methods: Approximation using polinomials.	2	
	Engineering application of numerical methods: Numerical	2	

	differentiation and integration. Search and optimization-basics.		
	Examples of setting up physical and mathematical models for different engineering problems. Development of corresponding algorithms and computer programs in C-language and MATLAB.	2	
	Second midterm exam		
	List of laboratory exercises		LE hours
	Visual studio, workspace, compiler, linker. Basic terms of C, Types, operators, expressions. printf().		2
	Declaring variables, formatted output, data input. scanf().		2
	Conditional expresions. Branching, if, if-else, if-else if-...-else		2
	Loops, while(), do-while(), for().		2
	Files, fopen(), fprintf(), fscanf(), feof().		2
	Arrays, 1D, 2D		2
	Functions, declaration, definition, passing arguments		2
	Pointers. Passing by value and by reference		2
	Introduction to numerical methods. Interpolation		2
	Introduction to numerical methods. Non-linear equations, successive halving and Newton's method		2
	Introduction to numerical methods. Integration, trapezoid quadrature, Simpson's method.		2
	Basics of MATLAB. Differences to C. Basic syntax.		2
	Numerical methods in MATLAB		2

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

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

Grading and evaluating student work in class and at the final exam	There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Each midterm test consists of respective theoretical questions and numerical problems. The final tests consist of overall theoretical questions and numerical problems. In the final exams, students that did not pass the midterm exams take part. The midterm and final exams are carried out as written tests. The requirement for passing grade is the positive assessment of laboratory exercises and 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,5 (M1 + M2) the activities in percentage: • M1, M2 – test results.

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

library and via other media)		**the library**	
	D. Vučina, "Primjena računala u inženjerskoj analizi", Sveučilište u Splitu, FESB, Split, 2007		
	I. Pehnec, materijali za vježbe		
Optional literature (at the time of submission of study programme proposal)	Željan Lozina, 'Uvod u programiranje', Sveučilište u Splitu, 2005 S. C. Chapra, R.P. Canale, "Numerical Methods for Engineers", McGraw-Hill 2006 G. Lindfield, J. Penny, "Numerical Methods using MATLAB ", Ellis Horwood 1995 W.Cheney, D. Kincaid, 'Numerical mathematics and computing', Brooks/Cole 2008		
Quality assurance methods that ensure the acquisition of exit competences	- Evaluation of results in accordance with the above learning outcomes - Feedback from students via surveys - Self-evaluation of teachers - Institutional and non-institutional evaluations		
Other (as the proposer wishes to add)			

NAME OF THE COURSE	COMPUTER AIDED DESIGN						
Code	FESC23	Year of study	2				
Course teacher	Gojko Magazinović, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	-	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	0	30
Status of the course	Obligatory	Percentage of application of e-learning	50				

COURSE DESCRIPTION

Course objectives	Training students for: - understanding and application of basic terms and principles of feature-based modeling, parametric modeling, and geometric modeling, - ability to build simple models, assemblies, and technical drawings by using a geometric modeling tool, - ability to solve simple engineering problems by using a spreadsheet tool.		
Course enrolment requirements and entry competences required for the course	Passed Mathematics 1 exam.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - explain fundamental principles of geometric modeling, parametric modeling, and feature based modeling, - describe an importance and available approaches to the exchange of design data between the different CAD systems, - use a computer aided design tool, - construct simple geometric models and assemblies, - solve simple engineering problems by using a spreadsheet tool, - draw a graph by using a spreadsheet tool, - calculate a surface area by using a Simpson's Rule.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction to a course. Description of an e-learning portal.	2	
	Introduction to CAD/CAM/CAE systems, part I: applications; the expansion of 3D CAD technology; acquiring and installation of Creo Parametric computer program.	2	
	Introduction to CAD/CAM/CAE systems, part II.	2	
	Elements of CAD/CAM/CAE systems; hardware; software.	2	
	Geometric modeling; feature based modeling; parametric modeling.	2	
	CAD data structures; exchange of design data between the different CAD systems.	2	
	A brief on structural analysis.	2	
	First midterm exam		
	History of computing and computers; computer representation of numbers; engineering calculations.	2	
	„Handle numbers with care“: numerical examples; sample workbooks.	2	
	Graphical representation of engineering results.	2	
	Numerical integration; equations; systems of equations.	2	
	Applications: propeller mass moment of inertia	2	
	Applications: parametric curves; spline.	2	
	Second midterm exam		

	List of laboratory or design exercises	LE or DE hours
	The environment of CAD design tool; extrusion of a closed curve.	2
	Sketch tool; extrude; round; chamfer; hole; parameters.	2
	Revolving of a closed curve.	2
	Design planes.	2
	Sections; shells, constraints; sketching utilities.	2
	Making assemblies.	2
	Technical drawing preparation.	2
	Spreadsheet tool elements; making a simple worksheet; built-in functions.	2
	Absolute and relative cell addressing; complex expressions.	2
	Working with data series; conditional formatting; graphing.	2
	Numerical integration: trapezoidal and Simpson's rule.	2
	Equations.	2
	System of equations: linear systems; nonlinear systems.	2

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☒ partial e-learning ☐ field work	☐ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☒ computer work (other)
Student responsibilities	Attendance of at least 70% lectures and all design exercises.	

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	2	Research		Practical training	
	Experimental work		Report		Individual work	0,8
	Essay		Seminar essay		Computer work	2
	Tests	0,2	Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	There are two midterm exams during the semester (carried out by using computer and e-learning portal; 90 minutes duration; first exam: 17 theoretical questions and two design problems; second exam: five theoretical questions and three numerical problems). The final exams attend students that didn't pass the midterm exams. The requirements for passing grade are the fulfillment of student responsibilities and at least 50% points on each midterm exam or the final exam. Grade (in percentage) is determined as follows: Grade(%) = (M1 + M2)/2 where M1 and M2 are the midterm grades. The final grades are: satisfactory (2), grades from 50% to 61%; good (3), grades from 62% to 74%; very good (4), grades from 75% to 87%; and excellent (5), grades from 88% to 100%.

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

			portal
Optional literature (at the time of submission of study programme proposal)	- K. Lee: Principles of CAD/CAM/CAE Systems, Addison-Wesley, Reading, 1999. - C. McMahon, J. Browne: CADCAM: Principles, Practice and Manufacturing Management, Prentice-Hall, Harlow, 1998.		
Quality assurance methods that ensure the acquisition of exit competences	- Evaluation of results by the above learning outcomes - Feedback from students via surveys - Institutional and non-institutional evaluations		
Other (as the proposer wishes to add)			

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">ELECTRICAL DRIVES</td></tr>
<tr><td>Code</td><td>FEND02</td><td>Year of study</td><td colspan="5">3.</td></tr>
<tr><td>Course teacher</td><td>Božo Terzić, Ph. D., Full Professor
Marin Despalatović, Ph. D., Assistant Professor</td><td>Credits (ECTS)</td><td colspan="5">4</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Goran Majić, Ph. D.</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>30</td><td></td><td>15</td><td>15</td><td></td></tr>
<tr><td>Status of the course</td><td>Elective</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 to:
- Get familiar with principle of operation and application areas of various types of electric machinery,
- Apply acquired knowledge in the analysis of existing and design of a new electrical drives.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">None</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:
1. Sketch the mechanical characteristics of various electric motors and working mechanisms (loads),
2. Explain the principle of operation of the voltage and/or frequency converter and methods for torque control of electric machines,
3. Describe experimental procedures for determining steady state and dynamic characteristics of electric machines,
4. Choose an electric motor to meet technical and economic requirements of drive,
5. Choose controlled or uncontrolled ED to adapt to working mechanism/ technological process,
6. Compute characteristic quantities of ED based on rated or measured electrical and mechanical quantities,
7. Discover the causes of errors and instability in the observed system,
8. Use computer tools for modeling and simulation of electric drives.</td></tr>
<tr><td rowspan="5">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="4">Course content</td><td>L or S hours</td><td>AE hours</td></tr>
<tr><td colspan="4">Introduction, basic terms and definitions, application areas and problems of electric drives (EDs). The main states of the EDs, working and braking modes of ED. The steady state of the ED. Mechanical characteristics of various mechanisms (loads).</td><td>2</td><td>1</td></tr>
<tr><td colspan="4">Structure and principle of operation of commutator machines. Types of excitation: independent, shunt, serial, compound, permanent magnets. Types of commutator machines: DC, AC, universal. Steady state mechanical characteristics of (separately and/or serial excited) commutator machines.</td><td>2</td><td>1</td></tr>
<tr><td colspan="4">Braking states of DC motor drive: generator, counter-current and electrodynamic braking.
Converter controlled DC motor drive. Ward Leonard speed control system. DC motor drive powered from chopper, single-phase and three-phase thyristor converters.</td><td>2</td><td>1</td></tr>
<tr><td colspan="4">Structure and principle of operation of slip ring and squirrel cage induction machines. Steady state mechanical characteristics of induction machines.</td><td>2</td><td>1</td></tr>
</table>

	Braking states of induction motor drive: generator, counter-current, electrodynamic and DC braking.		
	Converter controlled induction motor drive. Principle of operation and various topologies of frequency converters. Advantages and disadvantages of scalar, vector and direct torque control. Comparison of induction motor characteristics when operated with constant stator or mutual flux linkage, or constant stator current.	2	1
	Structure and principle of operation of synchronous machines. Various types of synchronous machines: round rotor, salient poles, reluctance, permanent magnet. Steady state mechanical characteristics of synchronous machines. Braking states of synchronous motor drive.	2	1
	Materials for permanent magnets. ED with electronically commutated motor. ED with permanent magnet synchronous motor.	2	1
	First midterm exam	2	1
	The dynamics of the EDs. The stability of operating point. Startup and sudden load of separately excited DC motor. Definitions of the electro-mechanical time constant and the constant of inertia.	2	1
	The dynamics of induction motor drives: startup and sudden load. Energy losses under transients. Multi-speed and Dahlander pole changing induction motors.	2	1
	Starting methods to limit starting current and torque of DC and AC machine drives: starters, star-delta and soft (thyristor controlled) startup. The heating and cooling performance of electric machines.	2	1
	The types of loads (S1-S10). Technical and economic aspects of electric machine selection. The selection of controlled or uncontrolled ED, energy savings. Examples of EDs: fan, pump, winch, hoist, marine propulsion.	2	1
	Estimation of system state variables based on the nominal data and measurements of electrical and/or mechanical quantities, the balance of power. The law of similarity, comparison of various variables and types of electric machines.	2	1
	Protection, monitoring and diagnostic of EDs. The causes of errors and instability.	2	1
	Second midterm exam		
	List of laboratory or design exercises		LE or DE hours
	1. Steady state characteristics of separately excited DC motor		2
	2. Electrodynamic braking of separately excited DC motor		2
	3. Thyristor converter fed DC motor drive		2
	4. Steady state characteristics of an induction motor		2
	5. Frequency converter fed induction motor drive		2
	6. Electronically commutated (BLDC) motor drive		1
	7. The dynamics of DC and induction machines		2
	8. Starting of a squirrel cage induction motor		2
Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☒ multimedia ☒ laboratory ☐ work with mentor ☐ (other)	

<table>
<tr><td>Student responsibilities</td><td colspan="6">The presence on lectures in the amount of at least 70% of the times scheduled. Performed all laboratory exercises.</td></tr>
<tr><td rowspan="6">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td>1,5</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td>2,3</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Laboratory exercises</td><td>0,5</td></tr>
<tr><td>Tests</td><td>0,1</td><td>Oral exam</td><td></td><td>Preparation for laboratory exercises</td><td>0,5</td></tr>
<tr><td>Written exam</td><td>0,1</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">There are two midterm exams during semester. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. By midterm exams students can pass the entire exam. On the exam (final, correctional and commission) students take the parts of course material which they did not pass on the midterm or previous exams. A separate part of the course material means the material of each midterm exam. The exams are carried out in written form. The duration of the midterm exams are 60 minutes, while exams are 2x60 minutes.

The requirement for passing grade is at least 50% of points on each (midterm) exam and the positive assessment (minimum 50% of points) of all laboratory exercises. Grade (in percentage) is formed as follows:

Grade(%) = 0,4•(ME1 + ME2) + 0,2•LE
where
ME1, ME2 - points obtained at (midterm) exams expressed in percentages
LE - average grade of all laboratory exercises expressed in percentages

The final grade is determined as follows:

Percentage Grade
0% to 49% insufficient (1)
50% to 61% sufficient (2)
62% to 74% good (3)
75% to 87% very good (4)
88% to 100% excellent (5)

Examinations are held in accordance with the course calendar schedule.</td></tr>
<tr><td rowspan="3">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">M. Jadrić, B. Terzić: Elektromotorni pogoni, Interna skripta, FESB, Split, 2007.</td><td></td><td>e-learning portal</td></tr>
<tr><td colspan="3">B. Jurković: Elektromotorni pogoni, Školska knjiga, Zagreb, 1990.</td><td>6</td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">I. Boldea, S. A. Nasar: Electric Drives, Taylor & Francis, Boca Raton, 2006.
B. K. Bose: Power Electronics and Variable Drives, IEEE Press, New York, 1997.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">- Keeping records of students course attendance
- Annual review of the performance of the examinations
- Evaluation of results in accordance with the above learning outcomes
- Feedback from students via surveys
- Self-evaluation of teachers</td></tr>
</table>

	- Institutional and non-institutional evaluations
Other (as the proposer wishes to add)	

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">ELECTRICAL ENGINEERING AND ELECTRONICS</td></tr>
<tr><td>Code</td><td>FENC01</td><td>Year of study</td><td colspan="4">3.</td></tr>
<tr><td>Course teacher</td><td>Ivan Marinović, Ph.D., Full Professor
Ivica Jurić-Grgić, Ph.D., Associate Professor</td><td>Credits (ECTS)</td><td colspan="4">4</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Duje Čoko,Ph.D,, Teaching assistant
Nedjeljka Grulović–Plavljanić, Teaching assistant
Ivan Krolo, Teaching assistant</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>30</td><td>0</td><td>15</td><td>15</td><td>0</td></tr>
<tr><td>Status of the course</td><td>Obligatory</td><td>Percentage of application of e-learning</td><td colspan="4">0</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
- application of basic principles and laws of electrical engineering,
- setting up and solving simple electrical circuits,
- permanent adoption of basic knowledge in the field of electrical machines,
- thorough understanding of physical principles within semiconductors
- basic digital and analog circuit analysis
- application of Boolean algebra
- understanding the basic functions of microcontroller systems</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:
- definethe fundamental phenomena, the quantities and the laws of electrical engineering,
- apply fundamental laws of electrical engineering for the calculation of electromagnetic quantities,
- analyse simple electrical networks,
- measure basic electrical values (current, voltage, resistance).
- describe basic principles of electrical machines.
- recognize basic analog and digital electronic circuits
- DC and AC analysis of basic circuits incorporating diodes and transistors
- solve Boolean algebra problems
- understand the basic microcontroller system functions</td></tr>
<tr><td rowspan="4">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">Electrostatics:electricity and physical property of matter;Coulomb's law;electric field; electric flux density, electrical work, electrostatic voltage,electrostatic potential, capacitance, capacitors, static electricity.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">DC currents: Electric circuits; electrical property of matter; Electrical conductivity and electrical resistance; voltage and current sources;Ohm's law; temperature dependence of electrical resistance; series, parallel and combination circuits; Kirchhoff's Laws; power and energy of DC current; circuit analysis techniques; electrolysis and chemical sources of electric current.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">Magnetism:Basics of magnetism; natural magnet and</td><td>2</td><td>1</td></tr>
</table>

	electromagnet; magnetic flux; Faraday's law; magnetic forces on moving charges and on a current-carrying wire; magnetic force between two parallel current-carrying wires; Ampere's Law; toroidal solenoid. Mutual and self inductance; leakage of magnetic flux; ferromagnetism; magnetic hysteresis; magnetic circuit; magnetic energy;magnetic force.		
	AC currents: Current and voltage sinusoidal waveform;form and crest factor; generation of a voltage sinusoidal waveform;Euler's formula for complex numbers;phase relationships in AC Circuits; Ohm's law in complex form;resistive and reactive impedance in AC Circuits; series, parallel and combination AC circuits; circuit analysis techniques using complex numbers; power and energy of AC current;three-phase AC circuits.	2	2
	Transformers and synchronous machines	2	0
	Induction motors	2	0
	DC motors; universal motors.	2	0
	Semiconductors: diodes, transistors, thyristors	2	2
	Analog electronic circuits	2	2
	Digital electronic circuits	2	2
	Microprocessors	2	0
	Sensors and actuators	2	0
	Microprocessor-assisted control of processes and machines	2	0
	List of laboratory exercises		LE hours
	Series, parallel and combination DC circuits		2
	Resistive and reactive impedance in AC Circuits		2
	Power of AC current		2
	Open circuit test on transformer		2
	Basic diode circuits		2
	Basic transistor amplifiers		2
	Operational amplifier		2
	Logic gates, multiplexer, demultiplexer		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)
Studentresponsibilities	The presence on lectures in the amount of at least 70% of the times scheduled. Performed all required laboratory exercises.	

Screening student work *(name the proportion of ECTS credits for eachactivity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	1	Research		Practical training	
	Experimental work		Report		Individual work	2
	Essay		Seminar essay		Laboratory exercises	0,5
	Tests	0,2	Oral exam		Preparation for laboratory exercises	0,2
	Written exam	0,1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	During the semester there will be two midterm tests. The first test will be at the eighth week of classes, the second at the first week of the exam period. Student can pass the entire exam by midterm tests. At the two final exams, students take parts of the curriculum that did not pass by midterm tests. If at the first final exam student passes one of the two parts of

<table>
<tr><td></td><td>curriculum that part of curriculum the student does not have to take on another final exam.

Students who did not pass the exam after two final exams can pass the exam at the last week of August or the first week of September. Last chance to take the exam in this school year is a so-called commission exam. So-called commission exam consist of two separated tests. First test dealing with electrical engineering consist 10 theoretical questions and 2 numerical problems while second one dealing with electronics consists of 6 theoretical questions and 2 numerical problems.

The condition for positive assessment is that the student has at least 50% of each part of the curriculum at the midterm tests or at the final exams. The final grade (in percent) is formed on the basis of all activities according to the formula:

Rating (%) = 0.1 * LV + 0.45 * (G1 + G2)

wherein the activity is expressed in percentage according to:

LV - percentage obtained by laboratory exercises,
G1, G2 - percentage obtained by midterm tests or final exams of the parts of curriculum given in lectures.

The final grade is determined as follows:

Rating Grade
50% to 61% sufficient (2)
62% to 74% good (3)
75% to 87% very good (4)
88% 100% excellent (5)</td></tr>
<tr><td>Required literature (available in the library and via other media)</td><td>
<table>
<tr><th>Title</th><th>Number of copies in the library</th><th>Availability via other media</th></tr>
<tr><td>I. Jurić-Grgić: Lectures, FESB</td><td></td><td>e-learning portal</td></tr>
<tr><td>I. Marinović: Lectures, FESB</td><td></td><td>e-learning portal</td></tr>
</table>
</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td>A. Maletić: Osnove elektrotehnike, ELMAP, Split, 1993.
R. Wolf: Osnove električnih strojeva, Školska knjiga, Zagreb, 1985.
J. Grilec, D. Zorc: Osnove elektronike, Školska knjiga, Zagreb, 2002.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td>- Evaluation of students presence on lectures
- Evaluation of results in accordance with the above learning outcomes
- Feedback from students via surveys
- Self-evaluation of teachers
- Institutional and non-institutional evaluations</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td></td></tr>
</table>

NAME OF THE COURSE	ENGINEERING GRAPHICS 1						
Code	FESR19	Year of study	1				
Course teacher	Željko Domazet, Ph.D., Full Professor	Credits (ECTS)	4				
Associate teachers	Miro Bugarin, Ph.D., Assistant Professor, Ivan Špar, Teaching assistant Dejan Bobić, Teaching assistant, Joško Kunac, Teaching assistant, Petra Bagavac, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			15	0	0	0	30
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	1	
	Ortogonal projection on 2 or 3 planes	1	
	Mutual position between point, line and plane	1	
	Metrics tasks	2	
	Projections of a geom. body	2	
	I. colloquium	2	
	Cross sections of different geometrical bodies	2	
	Intersections of different geometrical bodies	2	
	II. colloquium	2	
	List of constructive exercises		hours
	Metrics tasks		8
	Mutual position between point, line and plane		6
	Cross sections of different geometrical bodies		8
	Intersections of different geometrical bodies		8
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>2</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 colspan="2">Availability via other media</td></tr>
<tr><td colspan="3">Ž. Domazet, M. Bugarin „INŽENJERSKA GRAFIKA“-materials of lectures, FESB.</td><td></td><td colspan="2">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 colspan="2">Library FESB</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">- 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	ENGINEERING GRAPHICS 2						
Code	FESC20	Year of study	1				
Course teacher	Tonči Piršić, Ph.D., Associate Professor	Credits (ECTS)	4				
Associate teachers	Petra Bagavac, Teaching assistant Miro Bugarin, Ph.D. Assistant Professor Ivan Špar, Teaching assistant Joško Kunac, Teaching assistant Dejan Bobić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	0	0	30
Status of the course	Obligatory	Percentage of application of e-learning	40%				

COURSE DESCRIPTION

Course objectives	Training students for: -		
Course enrolment requirements and entry competences required for the course	None		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Ability of drawing technical drawings both by hand and by using the computer. Understanding of basis principles of engineering design.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Types of drawings. Drawing formats.	2	2
	Part lists. Scales. Line types and purposes. Layers. Prospective views. Isometric view. Orthogonal view.	4	4
	Cross-sections. Hatching. Reducing the number of views. Simplifications in drawings.	4	4
	Drawing of screw threads. Schematic representation of threads. Dimensioning: line, radius, diameter, arc.	4	4
	Dimensioning of cone and inclination. Dimensioning styles. Surface roughness. Parameters of surface roughness, symbols and application.	4	4
	Blocks and their properties. Using the blocks. Attributes. Prototype drawing. Tolerances and fits. Fit types.	6	4
	ISO system of fits. Geometric tolerances. Basic of AutoCAD.	2	6
	List of laboratory or design exercises		LE or DE hours

Format of instruction	☒ lectures ☐ 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		(Other)	
	Essay		Seminar essay		(Other)	
	Tests	1	Oral exam		(Other)	
	Written exam	2	Project		(Other)	

Grading and evaluating student work in class and at the final exam	There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks.		
Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	1. T. Piršić: "Tehničko crtanje", FESB - Split, 2010.		
	2. T. Piršić: "AutoCAD u strojarstvu", FESB - Split, 2010.		
	3. Grupa autora: Inženjerski Priručnik, IP1 – Temelji inženjerskih znanja (Chapter) “Inženjerska grafika”), Školska knjiga, Zagreb, 1999.		
	4. M. Opalić, M. Kljajin, S. Sebastijanović: “Tehničko crtanje”, Zrinski d. d. Čakovec, 2003.		
Optional literature (at the time of submission of study programme proposal)	Ć. Koludrović: “Tehničko crtanje u slici”, Naučna knjiga, Beograd, 1985.		
Quality assurance methods that ensure the acquisition of exit competences	- Lectures responsible for the same subject area collaborate closely and monitor each other's work. Occassional class observations and appraisal by Head of Department		
Other (as the proposer wishes to			

add)	

NAME OF THE COURSE	ENGLISH LANGUAGE 1						
Code	FEOD02	Year of study	1				
Course teacher	Daniela Matić, Ph.D., Assistant Professor	Credits (ECTS)	2				
Associate teachers	/	Type of instruction (number of hours)	L	S	AE	LE	DE
			0	30	0	0	0
Status of the course	Mandatory	Percentage of application of e-learning	0%				

COURSE DESCRIPTION

Course objectives	Training students for: - developing communicative and social skills necessary in naval architecture profession, primarily in everyday situations and those beyond the limits of their professional life; - acquiring and enhancing knowledge on foreign language structures; - improving English for special purposes knowledge at receptive level (written and oral reception) depending on the course of studies; - raising awareness of students' own responsibility in learning process.		
Course enrolment requirements and entry competences required for the course	None		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - recognize various text types, textual patterns and language activities; - identify and explain professional vocabulary; - recognize key ideas, words and sentences; - find and eventually use grammar structures typical for professional and scientific texts; - use various reading and listening methods in order to comprehend the context of authentic general English and professional texts; - present various topics orally and in written form; - analyze various professional materials and present them within professional communication procedures.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	1. Introduction to the course and requirements; introduction to Instructions and Presentation guide on the e-learning portal	2	
	Module 1 – The world of ships - Unit 1 - Naval architecture defined	2	
	Module 1 – Language work 1 – defining naval architecture terms; Unit 2 – Classification societies	2	
	Module 1 – Language work 2 – word formation - prefixes	2	
	Module 2 – The ship: beginnings - Unit 1 - A brief history of ships	2	
	Module 2 – Language work, revision 1 – perfective tenses	2	
	Module 2 - Unit 2 – From oars to sails only; Language work, revision 2 – present simple.	2	
	8. Mid-term exam	2	
	Module 3 – Shipbuilding in the Mediterranean - Unit 1 – the Mediterranean ship construction.	2	
	Module 3 – Language work 1 – general English vocabulary and naval architecture terminology; Unit 2 – The Split shipbuilding industry	2	
	Module 3 – Language work 2 – Revision of passive forms	2	

	Module 4 – Modern ships – Unit 1 – Properties of modern ships; Language work 1 – noun premodification	2	
	Module 4 – Unit 2 – Ship types	2	
	Module 4 – Language work 2 – noun premodification	2	
	15. End-of-term 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	In order to take an exam and eventually obtain a grade, each student has to fulfill the following requirements: - minimum class attendance of 70%; - delivered and positively graded presentation in English before other students during regular classes.	

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	1	Research	0.25	Practical training	
	Experimental work	/	Report	0.25	(Other)	
	Essay	/	Seminar essay		(Other)	
	Tests	0.5	Oral exam	/	(Other)	
	Written exam		Project	/	(Other)	

Grading and evaluating student work in class and at the final exam	During regular classes students are supposed to prepare and deliver a presentation on a topic of their choice, which will be graded. During the semester, students will be continuously assessed as they will take two exams, a mid-term and an end-of term exam. The former will be held in week 8 and the latter in week 15. Both exams will test their knowledge of English naval architecture lexis from the educational materials and grammar structures specific for their profession. If they fail at either of these exams or do not sit for them, they have to take the final exam scheduled in the examination period after the classes have finished. The final grade is calculated as follows: - written exam (mean of mid-term and end-of term exam positive results, or final exam) – 70% - positively graded presentation – 20% - regular attendance – 5% - written assignments (homework) – 5% All exams are scheduled according to the current academic year calendar.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Teaching materials and language exercises		e-learning portal

Optional literature (at the time of submission of study	Mance, Ksenija. (2006). *An English Reader for Naval Architects and Shipbuilders*. Rijeka: Tehnički fakultet Sveučilišta u Rijeci. Pritchard, Boris. (1995). *Maritime English 1*. Zagreb: Školska knjiga.

programme proposal)	
Quality assurance methods that ensure the acquisition of exit competences	- Regular class attendance records - Tutorials - 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 2						
Code	FEOD03	Year of study	1				
Course teacher	Daniela Matić, Ph.D., Assistant Professor	Credits (ECTS)	3				
Associate teachers	/	Type of instruction (number of hours)	L	S	AE	LE	DE
			0	30	0	0	0
Status of the course	Mandatory	Percentage of application of e-learning	0%				

COURSE DESCRIPTION

Course objectives	Training students for: - developing communicative and social skills necessary in naval architecture profession, primarily in everyday situations and those beyond the limits of their professional life; - acquiring and enhancing knowledge on foreign language structures; - improving English for special purposes knowledge at receptive level (written and oral reception) depending on the course of studies; - raising awareness of students' own responsibility in learning process.		
Course enrolment requirements and entry competences required for the course	None		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - recognize various text types, textual patterns and language activities; - identify and explain professional vocabulary; - recognize key ideas, words and sentences; - find and eventually use grammar structures typical for professional and scientific texts; - use various reading and listening methods in order to comprehend the context of authentic general English and professional texts; - present various topics orally and in written form; - analyze various professional materials and present them within professional communication procedures.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Module 5 – Materials in shipbuilding – Unit 1 – From wood to plastic	2	
	Module 5 – Language work 1: word formation-suffixes	2	
	Module 5 – Unit 2 – Shipbuilding materials and force	2	
	Module 5 – Language work 2: cause and effect	2	
	Module 6 – Ship geometry, measures and dimensions – Unit 1 – Ship geometry	2	
	Module 6 – Language work 1: relative clauses; Unit 2 – Measures and dimensions	2	
	Module 6 – Language work 2: reduced relative clauses	2	
	8. Mid-term exam	2	
	Module 7 – An outline of hydrostatics	2	
	Module 7 - Language work 1: Modal verbs	2	
	Module 7 – Language work 2: Conditionals	2	
	Module 8 – Ship structure – Unit 1 - Hull	2	
	Module 8 – Language work 1: discourse markers; Unit 2 – Framing	2	
	Module 8 – Language work 2: describing a process and writing	2	

	a report					
	15. End-of-term 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	In order to take an exam and eventually obtain a grade, each student has to fulfill the following requirements: - minimum class attendance of 70%; - delivered and positively graded presentation in English before other students during regular classes.					
Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Class attendance	1	Research	0.5	Practical training	
	Experimental work	/	Report	0.5	(Other)	
	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 regular classes students are supposed to prepare and deliver a presentation on a naval architecture topic of their choice, which will be graded. During the semester, students will be continuously assessed as they will take two exams, a mid-term and an end-of term exam. The former will be held in week 8 and the latter in week 15. Both exams will test their knowledge of English naval architecture lexis from the educational materials and grammar structures specific for their profession. If they fail at either of these exams or do not sit for them, they have to take the final exam scheduled in the examination period after the classes have finished. The final grade is calculated as follows: - written exam (mean of mid-term and end-of term exam positive results, or final exam) – 70% - positively graded presentation – 20% - regular attendance – 5% - written assignments (homework) – 5% All exams are scheduled according to the current academic year calendar.					
Required literature (available in the library and via other media)	**Title**			**Number of copies in the library**	**Availability via other media**	
	Teaching materials and language exercises				e-learning portal	
Optional literature (at the time of submission of study programme proposal)	Mance, Ksenija. (2006). *An English Reader for Naval Architects and Shipbuilders*. Rijeka: Tehnički fakultet Sveučilišta u Rijeci. Pritchard, Boris. (1995). *Maritime English 1*. Zagreb: Školska knjiga.					
Quality assurance	- Regular class attendance records					

methods that ensure the acquisition of exit competences	- Tutorials - 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">FLUID MECHANICS</td></tr>
<tr><td>Code</td><td>FESD 11</td><td>Year of study</td><td colspan="5">2</td></tr>
<tr><td>Course teacher</td><td>Prof. Zoran Milas, PhD</td><td>Credits (ECTS)</td><td colspan="5">6</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>3</td><td></td><td>2</td><td></td><td></td></tr>
<tr><td>Status of the course</td><td>Compulsory</td><td>Percentage of application of e-learning</td><td colspan="5"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
- solving the problems of engineering fluid mechanics by using the basic equations of fluid motion and developing student awareness of the solution limitations due to simplifications introduced
- interpreting the fluid flow characteristics.
- understanding of the Euler description of fluid motion using the control volume approach for fluid mechanics problems.
- interpreting the effects of turbulence on fluid flow.
- understanding of the basic principles of fluid flow similarity and dimensional analysis.
- using the concept of hydraulic losses in viscous fluid flow analysis.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Mathemetics1, Mathematics 2, Mechanics 2</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:
– calculate the pressure distribution in fluid (at rest) of constant and variable density
– determine the pressure forces on flat and curved surfaces and the pressure center,
– use the continuity and Bernoulli eq. for solving various flow problems of incompressible and compressible fluid (in stationary frame and rotating frame)
– critically apply the momentum equation and the moment of momentum equation
– interpret the results of model tests in order to predict the prototype flow characteristics
– derive the non-dimensional groups by applying simple methods of dimensional analysis.
– use the modified Bernoulli eq. for viscous pipe flow analysis and evaluate the effect of Reynolds number and pipe roughness on pipe friction coefficient
– analyze the flow distribution in moderately complex pipe grid</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 or S hours</td><td colspan="2">AE hours</td></tr>
<tr><td colspan="3">Introduction: Forces and stress in fluids. Fluid properties: density, coeff.of thermal expansion, bulk modulus. Newton viscosity law, dynamic and kinematic viscosity, non-Newtonian fluids.</td><td>3</td><td colspan="2">1</td></tr>
<tr><td colspan="3">Comparison of rigid and fluid body deformation. Surface tension and contact angle, Laplace-Young eq..
Statics: Pascal law, Euler eq. for fluid at rest, pressure distribution in fluid of constant and variable density.</td><td>3</td><td colspan="2">1</td></tr>
<tr><td colspan="3">Pressure forces on flat and curved surfaces, pressure center. Buoyancy.</td><td>3</td><td colspan="2">1</td></tr>
<tr><td colspan="3">Kinematics of fluid flow. Euler description of fluid motion,</td><td>3</td><td colspan="2">1</td></tr>
</table>

	Convective component of acceleration, streamline, stream tube and stream filament. Volume and mass flow rate.		
	Dynamics: Continuity equation, differential and integral form, simplified continuity equation. Deformable control volume.	3	1
	Euler equation for inviscid fluid flow, Bernoull eq. Coriolis coefficient for stream tube flow, Application of Bernoulli eq.	3	1
	Bernoulli eq. for rotating reference frame. Compressible fluid flow. Isentropic flow, speed of sound, Hugoniot eqs. Flow in open canals.	3	1
	Momentum eq. and moment of momentum eq. in inertial and non-inertial frame. Reynoldsov transport theorem.	3	1
	Similarity theory, Re, Fr, Eu, M, We, Gr, numbers. Incomplete similarity. Dimensional analysis.	3	1
	Viscous fluid flow. Loss of specific mechanical energy in developed fluid flow- modified Bernoulli eq.. Shear stress distribution in developed pipe-canal flow.	3	1
	Laminar and turbulent flow, critical Re number, turbulence, turbulence intensity. Velocity profile for laminar and turbulent pipe flow.	3	1
	Major and minor losses in pipe flow. Darcy-Weissbach eq., hydraulic radius, Pipe friction coefficient, Nikuradse and Moody chart, complex piping.	3	1
	Minor loss coefficients. Non-stationary effects.	3	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	Classroom attendance min. 70 % .	

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	2,9	Research		Practical training	
	Experimental work		Report		Individual work (prep. for tests-exam)	2,8
	Essay		Seminar essay		Laboratory exercises reports	
	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 midterm tests and final exams. The first midterm test takes place after 7 weeks of lecturing and the second one 6 weeks later. Each midterm test consists of 2-3 numerical problems and 12-16 short questions (incl. multiple choice questions) and 4-6 essay questions Students who did not pass the midterm tests exams take part in the final exams. The midterm and final exams are carried out as written tests (closed book). The requirement for passing grade is the positive assessment of laboratory exercises/reports and 50 % points on each midterm test/ final exam and successful completion of final oral exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,4(M1 + M2) +0,2 FOE

<table>
<tr><td></td><td colspan="3">the activities in percentage: ·
M1, M2 – test results., FOE-final oral exam</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>Milas, Z.: Fluid Mechanics 1, FESB, Split, 2015</td><td>12</td><td>e-learning</td></tr>
<tr><td>Virag, Z.: Mechanics of Fluids, FSB, Zagreb, 2000.</td><td>5</td><td></td></tr>
<tr><td>Pilić-Rabadan, Lj.: Mechanics of Fluids, UNIST, Split, 1995.</td><td>5</td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">- White F.M., Fluid Mechanics, McGraw Hill, 2010.</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	FINAL THESIS						
Code	FEXX01	Year of study	3				
Course teacher		Credits (ECTS)	12				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
Status of the course	Obligatory	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	12
	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)			

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">FUNDAMENTALS OF PRODUCTION TECHNOLOGIES</td></tr>
<tr><td>Code</td><td>FETD04</td><td>Year of study</td><td colspan="4">2</td></tr>
<tr><td>Course teacher</td><td>Nikša Krnić, PhD, Associate professor
Branimir Lela, PhD, Associate professor</td><td>Credits (ECTS)</td><td colspan="4">6</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Jure Krolo, Teaching Assistant
Domagoj Kojundžić, 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></td><td></td><td>15</td><td></td></tr>
<tr><td>Status of the course</td><td>Obligatory</td><td>Percentage of application of e-learning</td><td colspan="4">10%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
- obtaining a brief encyclopaedic overview of the basic production technologies and acquiring basic knowledge about the relationship among design, materials and technologies necessary for successful production in the field of shipbuilding and mechanical engineering
- acquiring basic knowledge about casting, forming by deformation, machining, metal joining and thermal cutting technologies and the application possibilities of these production processes for shipbuilding needs</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 technologies
- classify processes of casting, forming by deformation, chip forming machining, welding, brazing and soldering, thermal cutting
- analyse basic characteristics of individual mechanical engineering technologies
- demonstrate basic processes on available machines
- describe generally machines and equipment on which processes are carried out
- interpret the criteria for selection of manufacturing technologies/processes
- distinguish basic features of the processes with regard to processed material
- estimate the application of appropriate mechanical engineering technology/process to a specific product</td></tr>
<tr><td rowspan="10">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">Importance and classification of metal forming processes. Concept of plastic deformation and indicators of ductility</td><td>3</td><td>/</td></tr>
<tr><td colspan="4">Changes in materials caused by deformation; Anisotropy; Strain and strain rate; Flow stress and flow curves</td><td>3</td><td>/</td></tr>
<tr><td colspan="4">Processes of upsetting, forging, drawing and extrusion</td><td>3</td><td>/</td></tr>
<tr><td colspan="4">Processes of rolling and sheet forming by bending, deep drawing and stamping</td><td>3</td><td>/</td></tr>
<tr><td colspan="4">Processes of chip forming machining; Motion of tool and workpiece; Basic geometry; Forming and shapes of chips; Materials for cutting tools; Quality of machined surface</td><td>3</td><td>/</td></tr>
<tr><td colspan="4">Methods of processing with defined cutting tool geometry; Turning, shaping, drilling, milling, broaching and sawing</td><td>3</td><td>/</td></tr>
<tr><td colspan="4">Methods of processing with undefined cutting tool geometry; Grinding, honing, lapping</td><td>2</td><td>/</td></tr>
<tr><td colspan="4">First midterm exam</td><td></td><td></td></tr>
</table>

	Casting principles; Casting models and moulds types (permanent and expendable), construction and main parts; Liquid metal flow in moulds; Solidification mechanisms. Cast microstructures and features.	3	/
	Overview of casting processes; Sand casting; shell casting; pressure die casting, centrifugal casting, continuous casting, strip casting; Castability tests; Casting defects. Recommendation for castings design.	4	/
	Basic principles of metal joining; Hazards and safe welding practice; Classification of welding processes; Power sources; Joints and welding positions; Oxy-fuel welding; Arc welding; Shielded metal arc welding	3	/
	Submerged arc welding; MAG welding; MIG welding; TIG welding; Plasma welding	3	/
	Laser welding; Electron beam welding; Hybrid laser-arc and other advanced welding processes	3	/
	Soldering; Adhesive joining; Thermal cutting; Gouging; Thermal spraying; Weldability; Welding discontinuities; Mech. properties and quality of welded joints	3	/
	Second midterm exam		
	List of laboratory exercises		LE hours
	Changes in material properties after upsetting; Determination of friction coefficient		1
	Cold and hot open-die forging		1
	Extrusion of section on lab hydraulic press		1
	Metal sheet forming by bending, deep drawing and spinning		1
	Turning		1
	Face and peripheral milling		1
	Shaping; Drilling; Grinding		1
	Shielded metal arc welding		1
	Submerged arc welding; MAG welding		1
	MIG welding; TIG welding		1
	Oxy-fuel welding; Brazing; Soldering		1
	Plasma arc cutting; Oxy-fuel cutting		1
	Gouging; Thermal spraying		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	Presence at the lectures at least 70% and at the laboratory exercise 100% of the time scheduled. Preparation and submission of reports from laboratory exercises.	

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Class attendance	2,5	Research		Practical training	
	Experimental work	0,5	Report		Individual work	3
	Essay		Seminar essay		Laboratory exercises	
	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	During the semester there are two midterms and final exams. First midterm exam is after 7 weeks and the second is after 15 weeks of lectures. The requirements for a positive grade are 50% points on each midterm.

<table>
<tr><td></td><td colspan="3">Grade is forming in accordance with the following formula:
Grade (%)=(M1 + M2)/2
M1, M2 – score on midterms in percentage (%)

Grading policy:
Percentage Grade
50% do 61% sufficient (2)
62% do 74% good (3)
75% do 87% very good (4)
88% do 100% excellent (5)
Students who do not pass midterms attend regularly scheduled final written exam. The requirement for a positive grade on the final exam is to achieve 50% of overall points.

Examination terms: according to the timetable</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>Duplančić, I.; Krnić, N.; Bajić, D.: "Osnove tehnologija", autorizirana predavanja, FESB, Split 2005.</td><td></td><td>e-learning portal</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></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.Šavar,
– 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.
– Gojić M.: “ Tehnike spajanja i razdvajanja materijala”, Sveučlište u Zagrebu, Metalurški fakultet Sisak, 2003
– Cebalo, R.: "Obrada odvajanjem čestica", obrađena pitanja i zadaci, Zagreb, 2000.
– Ekimović Š.: "Postupci obrade rezanjem”, Univerzitet u Sarajevu, mašinski fakultet u Zenici, 2003.
– Cebalo R.: "Obrada odvajanjem čestica, Podsjetnik za ispit i zadaci, FSB Zagreb, 1999.
– Bajić D.: "Obrada obrada odvajanjem čestica”, predavanja, FESB Split, 2005.
– R. Deželić, Osnove konstrukcijskih materijala, Sveučilište u Splitu, FESB Split, 1996.
– Deželić R., Metali II, FESB Split, 1987
– Stupnišek M., F. Cajner: Osnove toplinske obradbe materijala, Sveučilište u Zagrebu, Zagreb, 1996.
– S. Kralj i Š. Andrić: Zavarivanje i srodni postupci, FSB Zagreb 1999.
– N. Krnić: Zavarivanje – podloge s predavanja, neobjavljeno</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 learning outcomes
- Feedback from students via surveys
- Self-evaluation of teachers</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

NAME OF THE COURSE	INTRODUCTION TO PUBLIC SPEAKING					
Code	FEOC04	Year of study	3			
Course teacher	Mirjana M. Kovač Ph.D., Assistant Professor	Credits (ECTS)	4			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			0	30	0	0
Status of the course	Elective	Percentage of application of e-learning				

COURSE DESCRIPTION

Course objectives	• understand the basic concepts related to verbal and nonverbal communication, as well as the factors that influence these concepts; • develop the skills of presentation planning, presentation structure, and presentation performance in the Croatian language; • organize speech information in a chronological order.
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. organize speech information in a chronological order; 2. use different types of public speaking; 3. give a persuasive presentation of ideas in front of an audience; 4. use notes for communication.

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L/S
	Definitions of communication; Overview of the theory of communication; Cross-cultural communication	0/2
	Verbal and nonverbal communication	0/2
	Questioning as a communication skill	0/2
	Active listening and Barriers to active listening	0/2
	Speech preparation	0/2
	Standard language and modal expressions	0/2
	Presentation skills	0/2
	Rhetorical figures of speech	0/2
	Public speaking fear	0/2
	Interpretative reading	0/2
	Taking notes	0/2
	Speech disfluencies	0/2
	Pronunciation speech exercises	0/2

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	Active participation in all activities: lectures, consultations, searching the literature, individual work.	

Screening student work *(name the proportion of ECTS credits for each*						
	Class attendance	1,6	Research		Practical training	
	Experimental work		Report		Individual work	1,6

<table>
<tr><td rowspan="4">activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Essay</td><td></td><td>Seminar essay</td><td>0,5</td><td>(Other)</td><td></td></tr>
<tr><td>Midterm exam</td><td>0,2</td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td>0,1</td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">The final grade is determined as the average of:
• assessment of oral presentation and peer assessment of oral presentation;
• assessment of written communication skills,
written and oral assessment.

There are two midterm exams and two examination periods. The first midterm exam is after 7 weeks of lecturing, and the second one is after the next 6 weeks. The lowest passing point is 50% in each midterm exam. The students who do not pass the midterm exams write the exams. The final grade for the course is calculated as a percentage of points earned. The final grade is determined applying the absolute ECTS grading system in accordance with the Rules of the Studying System of the University of Split.
At the end of the semester the grades are averaged to form a grade Point Average, according to this scale:

50% - 61% - sufficient (2),
62% - 74%- good (3),
75% - 87% - very good (4),
88% - 100% - excellent (5).

Students who fail the two exams in the first examination period take the exam in the autumn final examination period. The final exam consists of the material covered in both midterm exams.</td></tr>
<tr><td rowspan="2">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">Ivo Škarić. Temeljci suvremenog govorništva, Zagreb: Školska knjiga.2000.</td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6"></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	INTRODUCTION TO THE THERMODYNAMICS						
Code	FESD02	Year of study	2				
FESC06	Nižetić Sandro, Ph. D., Associate Professor	Credits (ECTS)	7				
Nižetić Sandro Ivan Tolj Dario Bezmalinović Grubišić-Čabo Filip	Ivan Tolj, Ph. D., Teaching assistant Dario Bezmalinović, Ph. D., Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			45	30	0	0	0
	Obligatory	Percentage of application of e-learning					
Obavezni							
Course objectives	Training students for: - Specify (list) basic thermodynamic terms and notations and apply general thermodynamic laws.						
Course enrolment requirements and entry competences required for the course	None.						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Classify and consider; basic thermodynamic terms, external influences and properties of state and connect them with causal relationship for considered property or analysed system, - Describe and implement general thermodynamic laws for specific properties or systems, - Implement thermodynamic charts for real properties to calculate their properties of state (values), - Consider and compute; flow systems, right and left ideal gas cycles and calculate heat to work efficiency, - Consider maximal work and calculate exergy flows.						

Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Introduction to the thermodynamics. External influences. Temperature, pressure and heat. Observer's aspect.	3 hours	2 hours
	Ideal gas equation and ideal gas mixtures.	3 hours	2 hours
	Equivalency of heat and work.	3 hours	2 hours
	Internal energy and First law of thermodynamics.	3 hours	2 hours
	Equilibrium polytropes.	3 hours	2 hours
	Ideal gas cycles and implementation of polytropes.	3 hours	2 hours
	Second law of thermodynamics.	3 hours	2 hours
	Analytical formulation of the second law of thermodynamics for reversible and irreversible processes.	3 hours	2 hours
	Entropy and statistical interpretation.	3 hours	2 hours
	Maximal work.	3 hours	2 hours

	Flow processes and implementation.	3 hours	2 hours
	Exergy analysis.	3 hours	2 hours
	Real properties, properties charts, Clapeyron-Clausiusova equation, Van der Waalsova equation.	3 hours	2 hours
	Properties curves for real gases, real gas power cycles.	3 hours	2 hours
	Left right cycles, refrigeration cycles and gas liquefaction.	3 hours	2 hours

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

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Class attendance	2,5	Research	4,5	Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam			
Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Nižetić, S. : Online predavanja dostupna na E-learning portalu, (2010)		
	Bošnjaković F.: Nauka o toplini I, tehnička knjiga, Zagreb 1978.	2	
	Y. A. Cengel, M.A.Boles, Thermodynamics, 4th Edition,McGrawHill, 2002.	1	
	Fabris O: Osnove inženjerske termodinamike, Pomorski fakultet u Dubrovniku, Dubrovnik 1994.		
Optional literature (at the time of	–Ražnjević K.: Toplinske tablice, Aksiom, Zagreb 2000. –Paić M.: Toplina i termodinamika, školska knjiga, Zagreb 1994.		

submission of study programme proposal)	–Zemansky, M.W., Dittman B.H.: heat and Thermodynamics, McGraw Hill Book Company, London 1987. –Ninić N.: Uvod u termodinamiku i njene tehničke primjene, Sveučilište u Splitu, FESB, (2008) – Baehr H.D.: Thermodynamik, Springer Verlag. Berlin 1984.
Quality assurance methods that ensure the acquisition of exit competences	- Evaluation of results in accordance with the above learning outcomes - Feedback from students via surveys - Self-evaluation of teachers - Institutional and non-institutional evaluations
Other (as the proposer wishes to add)	

NAME OF THE COURSE	MACHINE ELEMENTS							
Code	FESD06	Year of study	2					
Course teacher	Srdjan Podrug, Ph.D., Associate professor	Credits (ECTS)	5					
Associate teachers	Vjekoslav Tvrdić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE	
			30	0	0	0	30	
Status of the course	Obligatory	Percentage of application of e-learning	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.	2
	Fatigue strength. S-N (Wohler) diagram. Fatigue (Smith) diagram.	2
	Welded joints: conception, procedures, types, labeling, quality, design, calculation	2
	Threaded fasteners: conception and classification, Standard thread forms, materials. Design of the threaded fasteners. Forces and torque acting in bolted joints.	2
	Strength calculation of the threaded fasteners. Pin bolts and dowel pins. Spline shaft connections. Cylindrical and tapered shaft connections.	2
	Springs: classification, stiffness, work and calculation.	2
	Shafts: conception, materials, design, dimensioning, strength calculation.	2
	Bearings. The theory of hydrodynamic lubrication. Journal slider bearings. Design and calculation of journal slider bearings. Materials for bearings. Thrust slider bearings.	2
	Roller bearings. Types and labels. Dynamic and static load rating. Couplings and clutches. Classification. Rigid couplings. Flexible couplings. Friction clutches.	2
	Power transmissions and mechanical drives. Classification. Features and classification of gear drives.	2
	Main rule of toothing. Geometry of cylindrical gears.	2

	Gear loadings. Pitting load capacity. Tooth root load capacity.	2
	Bevel gears. Worm gear drives. Belt transmissions. Chain transmissions.	2
	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	3	Research		Practical training	
	Experimental work		Report		Individual work	2
	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)	

NAME OF THE COURSE	MARINE FLOATING OBJECTS						
Code	FESD19	Year of study	3				
Course teacher	Branko Blagojević, Ph. D., Full Professor	Credits (ECTS)	3				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	15	0	
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - Knowledge of the nomenclature and the type of marine engineering/floating objects. Describe and explain the functions of marine specific objects.		
Course enrolment requirements and entry competences required for the course	Ship geometry English language 1 and 2 Ship hydrostatics and stability		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - Explain the function of various types of marine floating objects (sea-based facilities). - Describe the economic, ecological and social aspects. - Explain the principle of the operation of various floating objects and structures. - Work independently in solving specific engineering problems related to the design of marine floating objects.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Physical and environmental aspects of marine engineering facilities. Geotechnical aspects.	2	
	Ecological and social impact. Materials and production.	2	
	Maritime operations. Coastal and Harbor Structures.	2	
	Moored floating structures.	2	
	Deep sea structures.	2	
	Seminar-project specific topics	2	
	Seminar-project specific topics	2	
	Seminar-project specific topics	2	
	Seminar-project specific topics	2	
	Seminar-project specific topics	2	
	Seminar-project specific topics	2	
	Seminar-project specific topics	2	
	Seminar-project specific topics	2	
	List of laboratory or design exercises		LE or DE hours
	Individual project task.		15
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		Research		Practical training	
	Experimental work		Report		Individual Assignment	1
	Essay		Seminar essay		(Other)	
	Tests		Oral exam	1	(Other)	
	Written exam		Project	1	(Other)	

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

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Gerwick BC Jr. Construction of Marine and Offshore Structures. CRC Press, 2000.	2	

Optional literature (at the time of submission of study programme proposal)	- Depending on project task.
Quality assurance methods that ensure the acquisition of exit competences	-
Other (as the proposer wishes to add)	

NAME OF THE COURSE	MARINE MACHINERY AND DEVICES						
Code	FESD15	Year of study	3.				
Course teacher	Gojmir Radica, Ph. D., Full Professor	Credits (ECTS)	3				
Associate teachers	Dario Bezmalinović, Ph. D., Teaching assistant Ivan Tolj, Ph. D., Teaching assistant Tino Sumić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	15	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	1
	Marine steam turbines systems.	2	1
	Marine gas turbines systems.	2	1
	Marine propulsion engines systems.	2	1
	Main parameters of marine engines	2	1
	Application of marine engine. Test bed and sea trial.	2	1
	Fuel, oil, cooling systems.	2	1
	Marine auxiliary engines, pumps, fans, compressors.	2	1
	Heat exchangers, fuel and oil separators.	2	1
	Deck machinery.	2	1
	Propeller systems.	2	1
	Rudder system. Ballast and bilge water system. Fire fighting systems, inert gas system	2	1

	Diesel-electric propulsion. Combined propulsion systems. IMO regulation.	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	1,2	Research		Practical training	
	Experimental work		Report		Individual work	1,5
	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.		

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">MATERIALS 1</td></tr>
<tr><td>Code</td><td>FETD07</td><td>Year of study</td><td colspan="5">1</td></tr>
<tr><td>Course teacher</td><td>Nikša Krnić, PhD, Associate professor
Dražen Živković, PhD, Professor</td><td>Credits (ECTS)</td><td colspan="5">5</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Domagoj Kojundžić, 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></td><td></td><td>15</td><td></td></tr>
<tr><td>Status of the course</td><td>Obligatory</td><td>Percentage of application of e-learning</td><td colspan="5">10%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Students are thought to distinguish the basic types of engineering materials and to understand their microstructure, bond types, resulting properties and their interactions.
Special emphasis is given on teaching the students about basic phase diagrams and their use. Fundamentals of ferrous metallic materials - steel and cast iron production, stable and meta-stable Fe – C phase diagrams and their micro-constituents are elaborated.
Insight in the mechanical properties of metals is given and standardised testing methods are described. Main non-destructive testing methods and their capabilities are presented and elaborated.</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 main groups of engineering materials,
- distinguish between amorphous and crystalline structure, various bond types and understand their characteristics,
- understand relationships and interactions between structure, composition and properties,
- understand and theoretically analyse basic phase diagrams,
- understand microstructure of carbon steels and generally estimate their main properties,
- classify and explain basic mechanical properties of metals and know how to practically test them,
- describe the main features of the non-destructive testing methods and to select the appropriate method.</td></tr>
<tr><td rowspan="7">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Course content</td><td>L hours</td></tr>
<tr><td colspan="5">Description of basic engineering materials and their distinguishing features and properties. Atoms and their bondings in metallic, polymer and ceramic materials.</td><td>3</td></tr>
<tr><td colspan="5">Fundamentals of structure. Crystal lattice types, features and irregularities.</td><td>3</td></tr>
<tr><td colspan="5">Phenomena during heating and cooling of metals – melting, crystallization, allotropic modification, cooling curves. Curies point.</td><td>3</td></tr>
<tr><td colspan="5">Mechanisms, types and features of deformation (elastic, plastic). Hot and cold deformation. Isotropy, anisotropy and quasi-isotropy.</td><td>3</td></tr>
<tr><td colspan="5">Basic binary phase diagrams – isomorphous binary system (complete solid solubility), phase (lever) rule. Components, phases and microstructure - main crystal types (pure metals, solid solutions, intermetallics, crystal mixtures).</td><td>3</td></tr>
<tr><td colspan="5">Eutectic and peritectic binary phase diagrams (limited solid solubility).</td><td>3</td></tr>
</table>

	Eutectic, peritectic and eutectoid reactions.	
	The iron – carbon phase diagram (equilibrium or stable state) - micro-constituents, correlation of carbon content and mechanical properties.	3
	First midterm exam	
	The iron – carbon phase diagram (metastable state) - carbon steels, micro-constituents, correlation of carbon content and mechanical properties. Classification of unalloyed steels according to carbon content. Properties and engineering application of ferrous alloys – steels and cast irons.	3
	Material's properties. Definitions of and basic mechanical properties of metals and standardized testing methods. Tensile test and main outcomes of testing.	3
	Hardness and hardness testing methods.	3
	Endurance limit, dynamic testing and fatigue life. Fracture types. Toughness and impact toughness testing. Ductile to brittle transition temperature. Creep.	3
	Principles and methods of non-destructive testing. Visual, penetrant dye and magnetic particle testing.	3
	Ultrasonic and radiographic testing. Other NDT methods -eddy-current, infrared and leak testing. Metallography. Determination of chemical composition.	3
	Second midterm exam	
	List of laboratory exercises	LE hours
	Demonstration of basic materials types – properties and methods of quantitative distinction of various materials.	1
	Heating and cooling of lead. Melting and crystallization. Practical measurement of heating and cooling curve.	1
	Experimental example of allotropic modification on low-carbon steel wire. Demonstration of Curie's point on low-carbon steel wire	1
	Isomorphous binary system phase diagram.	1
	Eutectic binary phase diagram.	1
	The iron – carbon phase diagram (stable state). Observation of microstructers on light microscope.	1
	The iron – carbon phase diagram (metastable state). Observation of microstructers on light microscope	1
	Practical tensile testing of mild steel.	1
	Practical demonstration of dynamic strength testing on fatigue testing machine. Charpy V-notch testing.	1
	Practical hardness testing on Brinell, Vickers, Poldy and Rockwell testing machine. Hardness according to the Shore and other dynamic methods.	1
	Practical demonstration of penetrant testing and magnetic particle testing.	1
	Demonstration of ultrasonic and radiographic examination.	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	Presence at the lectures at least 70% and at the laboratory exercise 100% of the time scheduled. Preparation and submission of reports from laboratory exercises.	

Screening student work *(name the proportion of ECTS credits for each activity so that the*	Class attendance	1,5	Research		Practical training	
	Experimental work		Report	0,5	Individual work	2,5
	Essay		Seminar essay		Laboratory exercises	0,5

total number of ECTS credits is equal to the ECTS value of the course)	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 announce regulary 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**
	Deželić, R.: "Metali - I dio", Split, Sveučilište u Splitu, FESB Split, 1998.		
	Anzulović, B.: "Materijali", Sveučilište u Splitu, FESB Split, 1993.		
	Deželić, R., „Osnove konstrukcijskih materijala", Sveučilište u Splitu, FESB, 1996.		

Optional literature (at the time of submission of study programme proposal)	Other publications in Croatian and English language and selected WEB sites dealing with fundamentals of metallic and other types of engineering materials
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	MATHEMATICS 1						
Code	FEMX01	Year of study	1				
Course teacher	Ivan Slapničar, Ph.D., Full Professor, Anita Matković, Ph.D., Associate Professor, Josipa Barić, Ph.D., Assistant Professor.	Credits (ECTS)	7				
Associate teachers	Ph.D. Nevena Jakovčević Stor, Irena Bego, Anita Carević, Marija Čatipović, Lea Dujić, Ivana Grgić, Lana Periša, Marina Mandić, Dajana Radišić, Mirjana Strukan, Stjepan Vedran Vukasović, Vanja Županović.	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, - reproduce proofs of basic theorems, - illustrate theorems with examples, - solve systems of linear equations, - apply vector calculus to analytical geometry of space, - interpret derivatives mathematically, geometrically and physically, - analyse functions of one variable, - test convergence of sequences and series of numbers and functions.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	1. Introduction. Relations. Functions. 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. Submatrices and subdeterminants. 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. Equations of a line. Equations of a plane. Applications of analytic geometry.	3	3
	6. Functions of a real variable: defining function, classification of functions. Limits and continuity. Asymptotes. Review of elementary functions.	3	3
	7. Derivatives. Tangent and normal. Differential and approximate computation.	3	3
	8. Higher derivatives and differentials. Derivatve of a parametric function. Theorems of differential calculus (Fermat, Rolle, Cauchy, Lagrange). L'Hospital's rule and limits of undetermined forms.	3	3
	9. Monotonicity. Necessary and sufficient conditions for extrema. Geometrical extrema.	3	3
	10. Curvature. Sufficient condition for convexity and concavity. Necessary and sufficient conditions for inflection points. Examining functions and drawing graphs.	3	3
	11. Sequences of real numbers. Basic inequality of convergence. Accumulation point and sub-sequence. Boundedness, monotonicity and convergence. Properties of limits. Cauchy series. Some important limits.	3	3
	12. Series of real numbers. Sufficient condition for convergence. Convergence criteria. Absolute convergence. Alternating series.	3	3
	13. Sequences of functions. Series of functions. Power series and convergence radius. Differentiating series of functions. Taylor series and applications.	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		

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 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. Student which did not pass any mid-term exam, take the final exam with

<table>
<tr><td></td><td colspan="3">comprehensive course content. In that case, masimum 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 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>I. Slapničar, Matematika 1, FESB, Split, 2002.</td><td>20</td><td>http://www.fesb.unist.hr/mat1</td></tr>
<tr><td>I. Slapničar, J. Barić, M. Ninčević, Matematika 1 – zbirka zadataka, FESB, Split, 2010.</td><td>20</td><td>http://www.fesb.unist.hr/mat1</td></tr>
<tr><td>Lecture materials on FESB e-learning portal.</td><td></td><td>httpd://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">- Petar Javor, Matematička analiza 1, Element, Zagreb, 2001.
- Luka Krnić i Zvonimir Šikić, Račun diferencijalni i integralni, I. dio, Školska knjiga, Zagreb, 1993.
- S. Pavasović i ostali, Matematika - riješeni zadaci, Građevinski fakultet, Split, 1999.
- B. P. Demidovič, Zadaci i riješeni primjeri iz više matematike s primjenom na tehničke nauke, Tehnička knjiga, Zagreb, 1995.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- homework
- short tests
- quizzes
- mid-term exams
- final exam
- student questionnaires</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">MATHEMATICS 2</td></tr>
<tr><td>Code</td><td>FEMX02</td><td>Year of study</td><td colspan="5">1</td></tr>
<tr><td>Course teacher</td><td>Ivan Slapničar, Ph.D., Full Professor,
Anita Matković, Ph.D., Associate Professor,
Josipa Barić, Ph.D., Assistant Professor.</td><td>Credits (ECTS)</td><td colspan="5">7</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Ph.D. Nevena Jakovčević Stor, Irena Bego, Anita Carević, Marija Čatipović, Lea Dujić, Ivana Grgić, Lana Periša, Marina Mandić, Dajana Radišić, Mirjana Strukan, Stjepan Vedran Vukasović, Vanja Županović.</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">10</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
- application of mathematical concepts and tools from the area of integral calculus, ordinary differential equations, functions of several variables and multiple integrals, to analyze and solve engineering problems.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Good knowledge of High School mathematics and passed State Exam in Mathematics.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:
- state definitions and theorems from the enitre course,
- reproduce proofs of basic theorems,
- illustrate theorems with examples,
- identify integrals which are elementary integrable and solve them.
- solve ordinary differential equations and systems of differential equations.
- apply differential equations to model population growth, heat conduction, the oscillator and the predator-prey system.
- identify quadratic surfaces
- analyze the extrema of real functions of several variables.
- apply a single and multiple definite integrals to computation of area, curve length, volume and center of gravity in the standard coordinate systems.</td></tr>
<tr><td rowspan="6">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="4">Course content</td><td>L or S hours</td><td>AE hours</td></tr>
<tr><td colspan="4">1. Indefinite integrals. Definition and basic properties. Table of basic integrals. Basic techniques of integration.</td><td>3</td><td>3</td></tr>
<tr><td colspan="4">2. Integration of rational functions. Integration of trigonometric functions. Recursive formulae.</td><td>3</td><td>3</td></tr>
<tr><td colspan="4">3. Integration of some irrational functions. Integrating a series of functions. Application of integrals to free fall with air resistance problem.</td><td>3</td><td>3</td></tr>
<tr><td colspan="4">4. Definite integrals. Definition and basic properties. Newton-Leibnitz formulae. Techniques of integration. Improper integrals.</td><td>3</td><td>3</td></tr>
<tr><td colspan="4">5. Application of definite integrals - the length of arc planar curve, volume and surface area of the rotating body. Numerical integration – trapezoid rule, Simpson’s rule, Richardson extrapolation.</td><td>3</td><td>3</td></tr>
</table>

	6. The functions of several variables. Definition and basic properties. Domain of the function. Limits and continuity. Quadratic surfaces.	3	3
	7. Partial derivatives. Differentiability. Tangent plane. Extrema of functions of several variables. Conditional extrema.	3	3
	8. Multiple integrals. Basic concepts and definitions. Double integral. Double integral in polar coordinates. Applications of double integral.	3	3
	9. Triple integral. Triple integral in cylindrical and spherical coordinates. Change of variables in multiple integrals.	3	3
	10. Introduction to Differential Equations. Basic concepts and definitions. Examples: modeling population growth, logistic equation, equation of heat conduction, Hooke's law. Equations with separable variables.	3	3
	11. Homogeneous differential equations. Exact differential equations. Integration factor. Linear differential equations of the first order.	3	3
	12. Bernoulli differential equation. Euler method as numerical procedure for solving linear differential equations. Differential equations of second order.	3	3
	13. Linear differential equations of second order with constant coefficients. Example: electronic circuits - harmonic oscillator. Systems of differential equations. Lotka-Volterra equations for predator-prey system.	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		

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 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

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

Student 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.</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>I. Slapničar, Matematika 2, skripta, FESB, Split</td><td></td><td>http://www.fesb.unist.hr/mat2</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></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">- Petar Javor, Matematička analiza 2, Element, Zagreb, 2000.
- Luka Krnić i Zvonimir Šikić, Račun diferencijalni i integralni, I. dio, Školska knjiga, Zagreb, 1993.
- 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 i kratki pregled definicija i teorema, FESB, 1999.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- homework
- short tests
- quizzes
- mid-term exams
- final exam
- student questionnaires</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">MATHEMATICS 3</td></tr>
<tr><td>Code</td><td>FEMC02</td><td>Year of study</td><td colspan="4">2</td></tr>
<tr><td>Course teacher</td><td>Ivan Slapničar, Ph.D., Full Professor,
Anita Matković, Ph.D., Associate Professor,
Josipa Barić, 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">Ph.D. Nevena Jakovčević Stor, mr. sc. Ivančica Mirošević, Irena Bego, Anita Carević, Marija Čatipović, Lea Dujić, Ivana Grgić, Lana Periša, Marina Mandić, Dajana Radišić, Mirjana Strukan, Stjepan Vedran Vukasović, Vanja Županović</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>30</td><td>0</td><td>30</td><td>0</td><td>0</td></tr>
<tr><td>Status of the course</td><td>obligatory</td><td>Percentage of application of e-learning</td><td colspan="4">10</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
application of mathematical concepts and tools from the area of Vector analysis, Fourier analysis and Laplace transformation, to analyze and solve engineering and economy problems.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Passed courses Mathematics 1 and Mathematics 2.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Students will be able to:
- state definitions and theorems from the enitre course,
- illustrate basic notions and connections between them with examples,
- apply Hamilton differencial operator on scalar and vector fields,
- calculate line integrals over scalar and vector fields,
- calculate surface integrals over scalar and vector fields,
- represent functions by Fourier series and integral,
- solve differential equations by use of Laplace transformation.</td></tr>
<tr><td rowspan="9">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">1. Vector analysis. Vector functions of scalar variable. Limits and continuity. Derivative and integral.</td><td>2</td><td colspan="2">2</td></tr>
<tr><td colspan="3">2. Scalar and vector fields. Gradient, divergence and curl. Hamilton and Laplace operator.</td><td>2</td><td colspan="2">2</td></tr>
<tr><td colspan="3">3. Conservative and solenoidal fields. Sidelong derivatives.</td><td>2</td><td colspan="2">2</td></tr>
<tr><td colspan="3">4. Line integrals. Curve parametrization. Tangent line. Line integral of a scalar field.</td><td>2</td><td colspan="2">2</td></tr>
<tr><td colspan="3">5. Line integral of a vector field. Flow, calculation of scalar potential and Green’s theorem.</td><td>2</td><td colspan="2">2</td></tr>
<tr><td colspan="3">6. Surface integrals. Surface parametrization. Tangent plane. Surface integral of a scalar field.</td><td>2</td><td colspan="2">2</td></tr>
<tr><td colspan="3">7. Surface integral of a scalar field. Gauss and Stokes theorems and their applications.</td><td>2</td><td colspan="2">2</td></tr>
<tr><td colspan="3">8. Fourir analysis. Periodic functions and periodic extensions. Ortogonal trigonometric systems.</td><td>2</td><td colspan="2">2</td></tr>
</table>

	9. Fourier series. Dirichlet's conditions. Convergence of Fourier series.	2	2
	10. Fourer series for even and odd functions. Parseval's equality.	2	2
	11. Fourier integral. Fourier transformation, inverse Fourier transformation theorems and their applications.	2	2
	12. Laplace transformation. Basic properties of Laplace's transformation. Inverse Laplace transformation.	2	2
	13. Convolution. Applications to differential equations.	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	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 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. Student 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).

<table>
<tr><td></td><td colspan="3">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.</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>L. Korkut, M. Krnić, M. Pašić, Vektorska analiza, Element, Zagreb, 2014.</td><td>5</td><td></td></tr>
<tr><td>N. Elezović, Fourierov red i integral, Laplaceova transformacija, Element, Zagreb, 2014.</td><td>5</td><td></td></tr>
<tr><td>Ivan Slapničar, Matematika 3, FESB, Split</td><td></td><td>http://www.fesb.unist.hr/mat3</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>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">Luka Krnić i Zvonimir Šikić, Račun diferencijalni i integralni, I. dio, Školska knjiga, Zagreb, 1993.
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 i kratki pregled definicija i teorema, Sveučilište u Splitu, FESB, 1999.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">- homework
- short tests
- quizzes
- mid-term exams
- final exam
- student questionnaires</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
</table>

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">MECHANICS 1</td></tr>
<tr><td>Code</td><td>FESC02</td><td>Year of study</td><td colspan="5">1.</td></tr>
<tr><td>Course teacher</td><td>Vedrana Cvitanić, Ph. D., Associate Professor</td><td>Credits (ECTS)</td><td colspan="5">7</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Marko Vukasović, Ph. D., Teachinf assistant
Maja KovačićTeaching 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>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:
- understanding and application of basic knowledge of mechanics of rigid bodies at state of rest,
- understanding basic concepts in mechanics such as force, moment of force, couple and system of forces (from system of concurrent forces to general spatial system of forces),
- studying equilibrium of body and equilibrium of system of bodies,
- determination and analysis of internal forces for beams and trusses.</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 quantities and concepts in mechanics (force, moment of force, couple, moment of couple, system of forces, connection, reaction of connection, external forces, internal forces),
- perform composition of system of forces (from system of concurrent forces to general spatial system of forces),
- apply equilibrium conditions for body and for system of bodies,
- compute reactions of connections for statically determined plane and spatial structures,
- consider and apply calculation of rough surface reaction as well as calculation of flexible belt friction,
- compute internal force components for statically determined plane and spatial beams and frames, plane arcs and trusses,
- compute centroid of homogenous bodies with composite shape,
- summarize equilibrium problem of flexible cables.</td></tr>
<tr><td rowspan="4">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. Connections. Reactions of connections. Axiom of connections.
System of concurrent forces. Composition of system of concurrent forces. Resultant.</td><td>3</td><td>2</td></tr>
<tr><td colspan="4">Determining components of force. Force projection on axis. Force projection on plane. Analytical defining of force. Equilibrium conditions of system of concurrent forces. Moment of force about point.</td><td>3</td><td>3</td></tr>
<tr><td colspan="4">Varignon theorem about moment of resultant of planar system of concurrent forces. Special forms of equilibrium conditions of planar</td><td>3</td><td>2</td></tr>
</table>

	system of concurrent forces. 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. Coplanar force system. Theorem about reduction of force at point. Reduction of coplanar force system at point. Representing coplanar force system by simplier form.	3	2
	Equilibrium conditions of coplanar force system. Equilibrium conditions of coplanar system of parallel forces. Equilibrium of system of bodies. Friction. Sliding friction. Reaction of rough surface.	3	6
	Friction angle and friction cone. Equilibrium under friction conditions. Friction of flexible belt. Rolling friction.	3	5
	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. Spatial system of parallel forces and couples. Moment of force about axis. Analytical defining of moment of force about point. Analytical defining of moment of force about axis.	3	3
	Moment of force about point as vector product of position vector and force vector. Equivalence of couples acting in parallel planes. Composition of spatial system of couples. Equilibrium conditions of spatial system of couples. Composition of spatial system of parallel forces. Center of system of parallel forces.	3	3
	Spatial system of forces. Composition of spatial system of forces. Representing spatial system of forces by simplier form. Equilibrium conditions of spatial system of forces. Equilibrium conditions of spatial system of parallel forces.	3	3
	Spatial beams. Internal force components of spatial beams. Examples of spatial beams. Centroid. Centroid of rigid body.	3	2
	Centorid of homogenous body. Centorid of homogenous bodies with composed shape. Experimental determination of body centroid. Pappus-Guldin rules. Flexible cables.	3	2
	List of laboratory exercises		LE 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	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*	Class attendance	2,6	Research		Practical training	
	Experimental work		Report		Individual work	4,1
	Essay		Seminar essay		Laboratory exercises	
	Tests	0,2	Oral exam		Preparation for laboratory exercises	

equal to the ECTS value of the course)	Written exam	0,1	Project		(Other)	

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

There are two midterm exams during the semester. After semester there are two final exam terms and one corrective exam term according to schedule. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks of lecturing. Each midterm exam is written and test consists of theoretical questions and numerical problems. The requirement for passing grade is 50% points on each midterm exam. In the final exams students that did not pass the midterm exams take part. In the corrective exam students take whole exam.

Final number of points is formed according to the formula:
Points(%)= (M1 + M2)/2
M1, M2 – points on midexams.

Final grade is determined after the second final exam by relative system of grading according to Regulations of studies and study system of University of Split. Based on the achived number of points students that have passed the exam are distributed into four groups: 15% of the best students get grade excellent (5), following 35% students get grade very good (4), following 35% students get grade good (3) and last 15% students get grade sufficient (2).

If the total number of students that have passed the exam at midterms and final exams is lower than 30, the final grade is determined by absolute system of grading. In this case, the final grade is determed by the achived final number of points in the following manner: from 50% to 61% - grade sufficient (2), from 62% to 74% - grade good (3), from 75% to 87% - grade very good (4) and from 88% to 100% - grade excellent (5).

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

According to Article 71 of Faculty Statue, students are obligate to contribute in all education activities and to attend at least 70% of lecture and exercise lessons. Above conditions are necessary to acess midterm and final exams.

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

Title	Number of copies in the library	Availability via other media
Pavazza, R.,"Mehanika - Statika", Školska knjiga, Zagreb, 2014.		
Plazibat, B., Matoković, A., "Mehanika 1 – zbirka zadataka“, FESB, Split, 1999.		
Cvitanić, V., "Predavanja iz kolegija Mehanika 1", FESB.		e-learning portal

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

Alfirević, I.; Saucha, J.; Tonković, Z., Kodvanj, J., "Uvod u mehaniku - I. Statika krutih tijela", "Uvod u mehaniku – II. Primjenjena statika", Golden marketing - Tehnička knjiga, Zagreb, 2010.
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.
Meriam, J. L.; Kraige, L. G.: "Engineering Mechanics-Statics", John Wiley & Sons, 2003.

Quality assurance methods that ensure the acquisition of exit competences

- 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
Other (as the proposer wishes to add)	

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="6">MECHANICS 2</td></tr>
<tr><td>Code</td><td>FESC21</td><td>Year of study</td><td colspan="5">1.</td></tr>
<tr><td>Course teacher</td><td>Željan Lozina, Ph.D., Full Professor</td><td>Credits (ECTS)</td><td colspan="5">5</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Ivan Tomac, Ph.D., Assistant Professor</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>AE</td><td>LE</td><td>DE</td></tr>
<tr><td>30</td><td>0</td><td>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 principles of motion geometry
- setting up and solving simple problems of motion geometry,
- permanent adoption and deepening of knowledge in the field of motion geometry.</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">1) Ability to analyze kinematics of the three-dimensional particle motion in various coordinate systems: cartesian, natural and cylindrical.
2) Understanding of the concepts of displacement, velocity and acceleration as vectors and how to determine them.
3) Ability to analyze the kinematics of two-dimensional (planar) rigid-body motion.
4) Ability to use concepts of angular displacement, angular velocity and angular acceleration
5) Ability of solving simple problems in geometry of motion
6) Explain constraint motion
7) Explain motion composition
8) Apply expression to plain motion
Apply SI units for mechanical values: position, displacement, velocity,, acceleration,…</td></tr>
<tr><td rowspan="14">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="4">Course content</td><td>L hours</td><td>AE hours</td></tr>
<tr><td colspan="4">Introduction to Kinematics. Basic Concepts.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">Rectilinear motion of particle.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">Curvilinear motion of particle. Coordinate systems.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">Constrained motion of particle. Equation of constraints.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">Relative motion of particle. Relative velocity. Relative acceleration.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">Transformation of coordinates.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">Degrees of freedom rigid body kinematics: displacement and motion types</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">First midterm exam</td><td></td><td></td></tr>
<tr><td colspan="4">Rotation of rigid body.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">General motion of rigid body – relative approach.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">Constrained motion of rigid body, kinematic pairs and mechanicsms.</td><td>2</td><td>2</td></tr>
<tr><td colspan="4">General motion of rigid body – absolute approach..</td><td>2</td><td>2</td></tr>
</table>

	Motion of body in space (3D motion).	2	2
	Euler theorem. Chasles theorem. Simple problems.	2	2
	Second midterm exam		
	List of laboratory exercises		LE 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	2,0	Research		Practical training	
	Experimental work		Report		Individual work	2,9
	Essay		Seminar essay		Laboratory exercises	0
	Tests	0	Oral exam		Preparation for laboratory exercises	0
	Written exam	0,1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Each midterm test consists of 10 theoretical questions and numerical problems and final tests consist of 20 theoretical questions and numerical problems. In the final exams students that did not pass the midterm exams take part. The midterm and final exams are carried out as written tests. The requirement for passing grade is 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,5 (M1 + M2) the activities in percentage: • M1, M2 – midterm test results. Relative grading according Faculty and University rules.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Ž. Lozina: Autorizirana predavanja, FESB		e-learning portal
	Ž. Lozina: Kinematika, FESB, Split.	5	

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	- Evaluation of results in accordance with the above learning outcomes - Feedback from students via surveys

the acquisition of exit competences	- 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">MECHANICS 3</td></tr>
<tr><td>Code</td><td>FESC04</td><td>Year of study</td><td colspan="5">1.</td></tr>
<tr><td>Course teacher</td><td>Željan Lozina, Ph.D., Full Professor</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
Ivan Tomac, 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>15</td><td>15</td><td>0</td></tr>
<tr><td>Status of the course</td><td>Obligatory</td><td>Percentage of application of e-learning</td><td colspan="5">0</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">Training students for:
- understanding and application of basic principles and laws of motion.
- setting up and solving simple problems of kinetics,
- permanent adoption and deepening of knowledge in the field of motion.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Mathematics 1, Mathematics 2, Mechanics 2 (FESC21), Mechanics of materials 1</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1) Understanding of the notion of a force as a vector. Ability to understand concepts of kinetic, potential and mechanical energies and the concept of a conservative force.
2) Understanding of the concepts of power and mechanical efficiency.
3) Ability to analyze particle dynamics
a) Ability to make a right decision related to a choice of the system of particles whose motion is to be studied.
b) Ability to correctly draw the free-body diagram (FBD) for the system.
c) Ability to write and solve Newton equations of motion for the system.
d) Ability to use principles derived from Newton’s second law, including Work & Energy, and Momentum.
4) Ability to rigid body kinetics
a) Ability to use concepts of angular displacement, angular velocity and angular acceleration.
b) Ability to draw a FBD for a system of rigid bodies.
c) Ability to determine mass moment of inertia for some simple body geometries.
d) 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 both SEI system of units in all mechanical quantities (linear and angular displacement, velocity and acceleration, mass, force, torque, work/energy, power, momentum, mass moment of inertia)</td></tr>
<tr><td rowspan="5">Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="4">Course content</td><td>L hours</td><td>AE hours</td></tr>
<tr><td colspan="4">Introduction to Kinetics. Basic Concepts.</td><td>3</td><td>1</td></tr>
<tr><td colspan="4">Dynamics of particle: direct application of Newton’s law.</td><td>3</td><td>1</td></tr>
<tr><td colspan="4">Solution of differential equation of motion.</td><td>3</td><td>1</td></tr>
<tr><td colspan="4">Work, energy, efficiency..</td><td>3</td><td>1</td></tr>
</table>

	Conservation of mechanical energy	3	1
	Impulse of force and momentum. Principle and conservation.	3	1
	Impulse of moment of force and angular momentum. Principle and conservation.	3	1
	First midterm exam		
	Kinetics of rigid body motion: Momentum and moment of inertia.	3	1
	Kinetics of rotation of rigid body.	3	1
	General motion of rigid body – relative approach.	3	1
	Space motion. Gyroscopic motion.	3	1
	Introduction to analytical mechanics.	3	1
	Vibration of particle.	3	1
	Second midterm exam		
	List of laboratory exercises		LE hours
	Galilo's experiments: free fall, incline plane, pendulum, gravitation		2
	Work and energy		2
	Impulse and momentum		3
	Moment of inertia		3
	Vibration		3

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

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	2,0	Research		Practical training	
	Experimental work		Report		Individual work	2,9
	Essay		Seminar essay		Laboratory exercises	0
	Tests	0	Oral exam		Preparation for laboratory exercises	0
	Written exam	0,1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	There are two midterms and final exams. The first midterm exam is after 7 weeks of lecturing and the second one is after the next 6 weeks. Each midterm test consists of 10 theoretical questions and numerical problems and final tests consist of 20 theoretical questions and numerical problems. In the final exams students that did not pass the midterm exams take part. The midterm and final exams are carried out as written tests. The requirement for passing grade is 50 % points on each midterm exam or the final exam. Grade (in percentage) is formed according to the formula: Grade(%) = 0,5 (M1 + M2) the activities in percentage: • M1, M2 – midterm test results. Relative grading according Faculty and University rules.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Ž. Lozina: Autorizirana predavanja, FESB		e-learning

			portal
	Ž. Lozina: Dinamika, FESB, Split.		
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	MECHANICS OF MATERIALS 1						
Code	FESC05	Year of study	1.				
Course teacher	Frane Vlak, Ph.D., Associate Professor	Credits (ECTS)	6				
Associate teachers	Marko Vukasović, Ph.D., Teaching assistant Branka Bužančić Primorac, Ph.D., Teaching assistant Maja Kovačić, Teanhing 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 laws of solid body mechanics, - introducing to stress and strain distribution in the beams under different types of loading (axial, torsion, bending, shear and combined loading).		
Course enrolment requirements and entry competences required for the course	Statics (Mechanics 1)		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - explain plane stress, plane strain and stress-strain relationship (Hooke's law), - analyse plane stress using Mohr's circle, - calculate geometrical properties of cross sections, - determine stress and displacements of beams under tension/compression, torsion and bending, - apply developed procedures to analyse and design simple structures (allowable stress and strain design), - solve statically indeterminate problems using the method of integration of the deflection curve and the method of equating displacements , - analyse beams under combined loadings using failure theories, - solve simple problems of buckling of columns.		
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. Stress transformation.	3	2
	Principal stresses. Mohr's circle for plane stress. Strain, normal strain, shear strain and dilatation. Strain tensor. Strain transformation. Mohr's circle for plane strain.	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. General approach to problems of mechanics of materials.	3	2
	Geometrical properties of plane areas, first and second moment of area. Parallel axis theorem. Transformation of second moments of area under rotation of coordinate system. Mohr's circle for second moments of area. Radius of gyration.	3	2
	Tension/compression. Prismatic beams and beams with varying cross sectional area. Displacement diagram. Stress concentration.	3	2

	Torsion of circular beams. Assumptions and constraints. Shear stress and strain. Allowable stress design. Bending. Assumptions and constraints.	3	2
	Pure bending. Transverse bending. Allowable stress design. Unsymmetric bending.	3	2
	First midterm exam		
	Differential equation of the deflection curve. Moment-area method. Stresses and strains of beams with nonuniform cross sections.	3	2
	Bending of thick curved beams. Shear. Influence of the shear on beam deflection.	3	2
	Statically indeterminate problems in tension/compression. Thermal effects, misfits and prestrains. Statically indeterminate problems in torsion. Statically indeterminate problems in bending.	3	2
	Strain energy. Failure theories.	3	2
	Failure theories for combined loading problems.	3	2
	Buckling of columns. Elastic and inelastic buckling. Design formulas for columns.	3	2
	Second midterm exam		

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work	☐ independent assignments ☒ multimedia ☐ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	The presence on lectures in the amount of at least 70 % of the times scheduled. Performed all required 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		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 (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Alfirević, I: Nauka o čvrstoći I, Tehnička knjiga, Zagreb, 1989.	5	
	F. Vlak: Autorizirana predavanja, FESB		e-learning portal

Optional literature (at the time of submission of study programme proposal)	Craig, R., R.: Mechanics of Materals, John Wiley & Sons, New York, 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	MECHANICS OF MATERIALS 2							
Code	FESC08	Year of study	2.					
Course teacher	Frane Vlak, Ph.D., Associate Professor	Credits (ECTS)	5					
Associate teachers	Marko Vukasović, Ph.D., Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE	
			30	0	30	0	0	
Status of the course	Obligatory	Percentage of application of e-learning	0					

COURSE DESCRIPTION

Course objectives	Training students for: - understanding and application of basic laws of structural analyses, - introducing to energy methods: the force method, the displacement method and method of initial parameters, - introducing to thin circular plates analysis.		
Course enrolment requirements and entry competences required for the course	Statics (Mechanics 1) and Mechanics of Materials 1.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - explain generalized force and displacement, flexibility and stiffness matrix, strain energy of beams, - explain Betti's theorem, Maxwell's theorem, Castigliano's theorems and theorems of minimum potential energy - apply Castigliano's theorems to plane beam structures (frames), - determine statical and kinematical indeterminancy of beam structures, - combine symmetry and antisymmetry of beam structures, - explain basic system of the force method and the canonical equations of the force method , - apply the force method to beam structures, - explain basic system of the displacement method and the canonical equations of the displacement method, - apply the displacement method to beam structures, - explain the method of initial parameters, - apply the method of initial parameters in the analysis of the displacements and internal force components, - calculate stresses and internal force components of thin circular plates.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	Work. Generalized force and displacement. Work-energy principle. Flexibility coefficients. Flexibility matrix. Stiffness coefficients. Stiffness matrix. Strain energy. Elastic strain energy for various types of loading. Clapeyron's theorem.	2	2
	Betti's theorem. Maxwell's theorem. Castigliano's theorems. Mohr's integral. Vereschagin's rule. Theorem of minimum potential energy. Theorem of minimum complementary potential energy.	2	2
	Types of beam structures. Degree of freedom. Statical indeterminancy. Kinematical indeterminancy.	2	2
	Symmetry and antisymmetry of beam structures.	2	2
	Basic system of the force method. Symmetrical basic systems.	2	2
	Canonical equations of the force method.	2	2
	Basic system of the displacement method.	2	2
	First midterm exam		

	Symmetrical basic systems for displacement method.	2	2
	Canonical equations of the displacement method.	2	2
	Method of initial parameters. State vector. Field matrix. Load vector.	2	2
	Several load distributions. Statical indeterminate problems.	2	2
	Bending of thin circular plates.	2	2
	Membrane stresses in axisymmetric shells. Thick walled pressure vessels.	2	2
	Second midterm exam		

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

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*						
	Class attendance	2,0	Research		Practical training	
	Experimental work		Report		Individual work	2,2
	Essay		Seminar essay	0,5	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(%) = 0,45 (M1 + M2) + 0,1S the activities in percentage: • M1, M2 – test results, • S - seminar essey.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Alfirević, I.: Nauka o čvrstoći II, Sveučilište u Zagrebu, Fakultet strojarstva i brodogradnje, Zagreb, 1999.	5	
	Pavazza, R.; Uvod u analizu tankostjenih štapova, Zagreb, 2007.	3	

Optional literature (at the time of submission of study programme proposal)	- Parnes, R.: Solid Mechanics, John Wiley & Sons, Chichester, 2001. - Solecky, R., Conant, R. J.: Advanced Mechanics of Materials, Oxford University Press, New York, Oxford, 2003.
Quality assurance methods that ensure	- Evaluation of results in accordance with the above learning outcomes - Feedback from students via surveys

the acquisition of exit competences	- Self-evaluation of teachers - Institutional and non-institutional evaluations
Other (as the proposer wishes to add)	

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		15	15	
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: - Explain free and forced vibrations, - Determine the natural frequency of the mechanical system with single degree of freedom, - Explain the concepts and phenomena: transferability, excitation imbalance, vibration isolation, - Explain the principles of noise isolation, - Apply the basic techniques of vibration isolation, - 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 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	NUMERICAL METHODS IN SHIPBUILDING						
Code	FESD16	Year of study	3				
Course teacher	Dario Ban Boris Ljubenkov	Credits (ECTS)	3				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	0	0	0
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Sposobnost razumijevanja trasiranja elemenata brodskih konstrukcija. Poznavanje numeričkog upravljanja u brodograđevnom proizvodnom procesu.		
Course enrolment requirements and entry competences required for the course	Položeni predmeti Geometrija broda i Konstrukcija broda.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. Objasniti pojam trasiranja u brodogradnji. 2. Nabrojati numeričke metode u brodogradnji vezano za trasiranje. 3. Izraditi 3D model brodskog trupa za razvijanje limova. 4. Pripremiti nacrte i podatke za krojenje limova trupa.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Povijesni osvrt.	3	
	Tradicionalno trasiranje u brodogradnji.	3	
	Izglađivanje brodske forme.	3	
	Pregled i korištenje numeričkih metoda u brodogradnji.	3	
	Numeričko trasiranje.	3	
	Određivanje šavova i stikova.	3	
	Razvijanje vanjske oplate.	3	
	Razvijanje različitih elemenata brodske strukture.	3	
	Određivanje šablona.	3	
	Trasiranje elemenata kolijevki za montažu brodskih sekcija.	3	
	Priprema podataka za montažne upore.	3	
	Izrada 3D modela brodskog trupa na računalu.	3	
	Priprema nacrta prema podacima iz modela.	3	
	List of laboratory or design exercises		LE or DE hours
Format of instruction	☒ lectures	☐ independent assignments	

<table>
<tr><td></td><td colspan="6">☒ seminars and workshops
☐ exercises
☐ on line in entirety
☐ partial e-learning
☒ field work</td><td colspan="2">☒ multimedia
☐ laboratory
☐ work with mentor
☒ project (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="8"></td></tr>
<tr><td rowspan="5">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td>1</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>(Other)</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td>1</td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="8">Kontinuirana provjera znanja provodi se tijekom nastave na predavanjima, vježbama, seminarima, radionicama te kroz konzultacije. Zadaci vezano za rad na projektu se predaju u el. obliku i brane usmeno kroz prezentacije. Na prezentacijama sudjeluju svi studenti na CDIO projektu te se interaktivno provjerava njihovo znanje. Polaganje ispita: usmena obrana projektnih zadataka.</td></tr>
<tr><td rowspan="6">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">M. Grubišić: Tehnologija gradnje broda, Split, 1978.</td><td></td><td>e-learning</td></tr>
<tr><td colspan="5">R. Vareško: Integralni CAD/CAM sustav za potrebe brodogradnje, Pula, 1994.</td><td>5</td><td></td></tr>
<tr><td colspan="5">Računalni program MacSurf.</td><td>5</td><td></td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td colspan="5"></td><td></td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">1. USCS: NC obrada trupa, CAD priručnik.
2. A. Rogulj: Numeričke metode u brodogradnji, CRS, interni priručnik, Split</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="8">- Vođenje evidencije o prisutnosti na nastavi. Godišnja analiza uspješnosti polaganja ispita. Studentska anketa s ciljem evaluacije nastavnika. Samoevaluacija nastavnika. Povratna informacija od strane studenata koji su već diplomirali o relevantnosti sadržaja predmeta.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="8"></td></tr>
</table>

NAME OF THE COURSE	PROBABILITY AND STATISTICS						
Code	FEMX04	Year of study	2				
Course teacher	Ante Rozga, Ph. D., Full Professor	Credits (ECTS)	5				
Associate teachers	Marina Mandić	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	20				

COURSE DESCRIPTION

Course objectives	Getting to know the importance of statistical methods in the professional and scientific work. Independent analysis and interpretation of data obtained through statistical surveys. Statistical way of thinking with the help of probability theory. Qualification for independent reasoning with statistical estimation and hypothesis testing.		
Course enrolment requirements and entry competences required for the course	None.		
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After completing the course, students will be able to: • Choose and apply methods of descriptive and inferential statistics. • Calculate and interpret indicators of descriptive statistics. • Estimate parameters, point estimate and interval estimate. • Calculate the accuracy and reliability of statistical estimates. • Set up and test the statistical hypothesis. • Connect variable correlation analysis and regression analysis. • Analyze and interpret the results of statistical surveys.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours	AE hours
	The Scales of Measurement. Grouping and Presentation of data.	2	2
	Measures of Central Tendency. Measures of Variability. Measures of Skewness and Kurtosis.	2	2
	Probability. Addition and Multiplication law. Conditional probability. Bayes theorem.	2	2
	Discrete Random Variables. Discrete Probability Distributions.	2	2
	Continuous Random Variable. Continuous Probability Distributions.	2	2
	Sample Design. Point and Interval Estimation of Population Parameters.	2	2
	Hypothesis Testing of One Mean. Hypothesis Testing of One Proportion.	2	2
	First Midterm Exam.		
	Errors in Hypothesis Testing. Sample Size Design.	2	2
	Hypothesis Testing of Difference between Two Population Means. Hypothesis Testing of Difference between Two Population Proportions. Dependent and Independent Samples.	2	2
	Distribution Fitting. Goodness-of-Fit Tests.	2	2
	Contingency Tables Tests.	2	2
	Analysis of Variance.	2	2
	Correlation.	2	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..</td></tr>
<tr><td rowspan="6">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td>2</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>Individual work</td><td>2</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Laboratory exercises</td><td></td></tr>
<tr><td>Tests</td><td>1</td><td>Oral exam</td><td></td><td>Preparation for laboratory exercises</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td colspan="6"></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 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 2 theoretical questions and 8 numerical problems and final tests consist of 4 theoretical questions and 10 numerical problems. Final grade is as follows:
50% - 61% sufficient
62% - 74% good,
75% - 87% very good,
88% - 100% excellent.
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.</td></tr>
<tr><td rowspan="3">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">A.Rozga: Statistika za ekonomiste. Ekonomski fakultet 2009.</td><td>2</td><td></td></tr>
<tr><td colspan="5">I.Pavlić: Statistička teorija i primjena. Tehnička knjiga. Zagreb. 1985.</td><td>5</td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="8">V.Vranić: Vjerojatnost i statistika. Tehnička knjiga 1971.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="8">- 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="8"></td></tr>
</table>

NAME OF THE COURSE	PROFESSIONAL TRAINING									
Code	FEXX06	Year of study	3							
Course teacher	Head of the professional training from the Faculty	Credits (ECTS)	5							
Associate teachers	Head of the professional training from the private institution	Type of instruction (number of hours)	L	S	AE	LE	DE			
Status of the course	Elective	Percentage of application of e-learning								
COURSE DESCRIPTION										
Course objectives	Training students for: - consolidating theoretical knowledge and practical skills in solving highly complex engineering problems - acquaintance with the organization, work and business of the receiving institution, - solving practical problems, - inclusion in the labour market, - writing technical reports									
Course enrolment requirements and entry competences required for the course	Acquired 120 ECTS credits									
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: - consolidate theoretical knowledge and practical skills in solving problems - use literature, databases and other sources of information - select appropriate methods and procedures for solving practical problems - apply technical knowledge and skills to effectively solve engineering problems - prepare a written report on the work results									
Course content broken down in detail by weekly class schedule (syllabus)	Professional training is the independent work of the student performed in the receiving institution in accordance with the plan and programme agreed between the head of the professional training from the receiving institution and the head of professional training from the Faculty.									
Format of instruction	☐ lectures ☐ seminars and workshops ☐ exercises ☐ *on line* in entirety ☐ partial e-learning ☒ field work		☒ independent assignments ☐ multimedia ☐ laboratory ☒ work with mentor ☐ (other)							
Student responsibilities	Independent work									
Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Class attendance		Research		Practical training	4				
	Experimental work		Report		Independent work					
	Essay		Seminar essay		Report writing	1				
	Tests		Oral exam		(Other)					
	Written exam		Project		(Other)					
Grading and evaluating student work in class and at	Professional training is not evaluated. Students are obliged to complete professional training in accordance with the Regulation on professional training and to write a Professional training report. Professional training report is validated by									

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

NAME OF THE COURSE	PROJECT						
Code	FESD23	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	15	0	30	0
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 geometry, 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: - Describe basic process of marine vehicle design. - Identify and estimate (calculate) important properties in the early design phase. - Schedule, plan and organize implementation of specific tasks in marine vehicle design project. - Work in team on solving practical engineering problems. - Present marine vehicle project, individually and as a member of a group (team). - Choose the best communication technique for design presentation regarding to various audience. - Critically discuss 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. Division of project tasks to specific topics.	15	
	List of laboratory or design exercises		LE or DE hours
	Solving design problem. Individual and team-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	Contionus assessment of student's work on project problems. Peer assessment.

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 project.		

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	PROPULSION SYSTEM OF SMALL SHIPS						
Code	FESS29	Year of study	3.				
Course teacher	Prof. dr. sc. Gojmir Radica	Credits (ECTS)	3				
Associate teachers	Dr. sc. Željko Penga Dipl.ing. Tino Sumić	Type of instruction (number of hours)	L	S	AE	LE	DE
			30	0	30		
Status of the course	Elective	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - understanding basic principles of marine propulsion system of small ships, - understanding application of marine propulsion system in small ships.		
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 for small ships, - 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 engines types and development.	2	2
	Marine diesel propulsion engines for small ships – characteristics.	2	2
	Types of application.	2	2
	Load characteristics.	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	1,0	Research		Practical training	
	Experimental work		Report		Individual work	1,7
	Essay		Seminar essay		(Other)	
	Tests	0,2	Oral exam		(Other)	
	Written exam	0,1	Project		(Other)	

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

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 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	SHIP EQUIPMENT						
Code	FESD10	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.		
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	SHIP GEOMETRY						
Code	FESD01	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	30	0
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, together with applying mathematical methods and tools for manual and computer based drawing of 2D and 3D ship hull geometry.		
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. - Tell basic mathematical methods for ship geometry description. - Describe and apply the procedure for development of technical lines plan drawing. - Apply computer program for 3D drawing of D 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	
	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	
	Mathematical description of hull forms.	2	
	Polynomial description of hull forms.	2	
	Geometric properties of curves and surfaces.	2	
	The description of hull forms using spline curves.	2	
	The description of hull forms using B-spline and NURB-spline curves.	2	
	3D parametric description of ship hull forms. The conditions for existance of developable surfaces.	2	
	List of laboratory or design exercises		LE or DE hours
	Project. Exercises with independent assignments.		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	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
	Lipschutz M. Differential Geometry. Schaum's Outline Series, McGraw-Hill, Inc.		

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 HYDROSTATICS AND STABILITY						
Code	FESD09	Year of study	3				
Course teacher	Dario Ban, Ph. D., Assistant Professor	Credits (ECTS)	7				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	45	0	0
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 stability for intact and damaged ship, 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. - Distinguish the methods for calculation of damage ship stability. - 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
	Archimed's law. Floatation conditions. The basics of ship's hydromechanics.	3	
	The calculation of hydrostatics characteristics of immersed ship hull.	3	
	Ship's centration. Inclination test. The effects of weight change or shift during loading/unloading on ship centre of gravity and her trim.	3	
	Bonjean curves plan. Hydrostatic particulars diagram.	3	
	Righting levers curve. Static stability, initial stability and metacenter.	3	
	Dynamic stability. Heeling moments.	3	
	Elementary stability curves. Metacentric curve. Curves of centers of buyancy. Waterlines curve.	3	
	The stability for large angles. Pantocarene isoclines. Unification of stability calculations.	3	
	Harmonic oscilator of one-degree.	3	
	The influence of free surface moment on ship stability.	3	
	IMO and Classification societies rules for stability.	3	
	Floodable lengths calculation.	3	
	Damage stability calculation. Grounding.	3	
	List of laboratory or design exercises		LE or DE hours
	Project.		45

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	0.5	Practical training	
	Experimental work		Report		Individual work	2
	Essay		Seminar essay		(Other)	
	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		
	Uršić J. Stabilitet broda II. 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	SHIP RESISTANCE AND PROPULSION						
Code	FESD07	Year of study	3				
Course teacher	Branko Blagojević, Ph. D., Full Professor	Credits (ECTS)	7				
Associate teachers	Josip Bašić, Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	0	30	15
Status of the course	Mandatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION			
Course objectives	Training students for: - Understanding of 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: - Explain origins of ship resistance components. - Compare empiric and numeric methods in calculation of ship resistance. - Select appropriate approach for power prediction and selection of main engine and propeller for a given ship. - Apply software for computational fluid dynamics on a given ship geometry.		
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L or S hours	AE hours
	Historic development of ship hydrodynamics. Ship resistance. Division of ship resistance to components. Similarity laws in ship hydrodynamics.	3	
	Overview of experimental methods for estimation of ship resistance. Model tests. Extrapolation of model test results. Correlation of resistance model-ship.	3	
	Basic equations of flow around ship hull. Friction resistance.	3	
	Boundary layer. Viscous resistance.	3	
	Surface waves in gravity field. Ship wave systems. Potential theory. Wave resistance.	3	
	Influence of depth on resistance. Other resistances. Empiric methods for calculation of ship resistance.	3	
	Numeric approach for prediction of ship resistance and flow.	3	
	Ship hull design from resistance viewpoint. Procedures for hull geometry improvement.	3	
	Components of propulsion power. Propulsion efficiency. Overview of types of propulsors. Hydrodynamic theory of propulsors.	3	
	Propeller design and strength. Calculation methods.	3	
	Wave. Cavitation. Model tests.	3	
	Power prediction procedure.	3	
	Power prediction procedure 2.Trial run.	3	
	List of laboratory or design exercises		LE or DE hours
	Procedures for estimation of resistance (using commercial software) and selection of propeller and main engine for a given ship. Individual assignments for CFD calculations (using commercial software).		45

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)	3
	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)	1. Vučinić A. Ship Hydrodynamics: Resistance. Sveučilište u Rijeci, Tehnički fakultet, 1997. 2. Van Lameren, W. P. A., "Resistance and propulsion of ships", Brodarski institut, Zagreb, 1952. 3. 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	SHIP STRUCTURAL DESIGN						
Code	FESD05	Year of study	2				
Course teacher	Branko Blagojević, Ph. D., Full Professor	Credits (ECTS)	7				
Associate teachers	Paul Jurišić, Ph. D., Teaching assistant	Type of instruction (number of hours)	L	S	AE	LE	DE
			45	0	0	0	45
Status of the course	Mandatory	Percentage of application of e-learning	0				

COURSE DESCRIPTION

Course objectives	Training students for: - Understanding function of ship structural components and whole structure, structural design of modern merchant ships, scantlings calculation using the rules of classification societies and international regulations, and loads on ship structures.		
Course enrolment requirements and entry competences required for the course	Ship geometry Mechanics 1 Mechanics of materials English language 1 and 2 Probability and statistics		
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. Technical documentation.	3	
	Terminology. Overview of ship types. Basic building elements. Systems of structural arrangement (longitudinal, transverse, mixed, combination).	3	
	Review of ship structural design approaches. General structural design principles: alignment, continuity, integrity.	3	
	Entities of structural strength. Overview of loads on ship structures. Overview of failure modes.	3	
	Bottom structure. Shell plating. Bulkheads.	3	
	Side structure. Framing. Deck structures. Hatches.	3	
	Structural tanks. Superstructure. Fore and aft structure.	3	
	Longitudinal strength.	3	
	Transverse and local strength.	3	
	Panel strength. Girders. Fatigue strength.	3	
	Deterministic wave theory.	3	
	Wave spectra and probabilistic description of sea states.	3	
	Strip method.	3	
	List of laboratory or design exercises		LE or DE hours
	Project: for a given ship construct midship section and longitudinal cross-section using the rules of classification societies.		45

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 Assignment	2
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam		Project	3	(Other)	

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

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
	Uršić J. Strength of ships I. FSB, Zagreb 1972.	3	
	Hughes O, Paik JK. Ship Structural Analysis and Design. SNAME 2010. ISBN 978-0-939773-78-3.	2	
	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	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 TECHNOLOGY						
Code	FESD12	Year of study	3				
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	**Title**	**Number of copies in the library**	**Availability via other media**

library and 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	SHIPYARD ORGANIZATION AND MANAGEMENT						
Code	FETD06	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	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	WELDING IN SHIPBUILDING						
Code	FETD05	Year of study	3.				
Course teacher	Ph.D. Nikša Krnić, Associated professor	Credits (ECTS)	3				
Associate teachers		Type of instruction (number of hours)	L	S	AE	LE	DE
			30			15	
Status of the course	Elective	Percentage of application of e-learning	40				

COURSE DESCRIPTION

Course objectives	The aim is to teach the students about specifics of welding, requirements on welding and and cutting for shipbuilding applications and shipbuilding needs and to give them insight in behavior of typical shipbuilding metals during welding and cutting. Another objective is to furnish students with knowledge needed for selection of welding processes, filler metals, consumables, welding parameters and equipment.	
Course enrolment requirements and entry competences required for the course	Succesfully acomplished Materials 1, Shipbuilding materials and Fundamentals of production technologies.	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Upon successful course completion it is to be expected from students: 1. to specify basic types and features of electric arc processes, 2. to specify other welding processes and methods, 3. to explain typical defects in welded joints and to prevent them, 4. to specify and distinguish weldability of shipbuilding steels, 5. to specify welding equipment, 6. to apply regulations, specifications and guidelines from classification societies for effective and safe welding.	
Course content broken down in detail by weekly class schedule (syllabus)	Course content	L hours
	Brief historical overview of joining in shipbuilding. Electric arc welding processes for shipbuilding.	2
	Mechanized, automated and robotic welding.	2
	High efficiency welding processes.	2
	Laser beam welding (LBW).	2
	Hybrid laser – arc welding processes.	2
	Solid state welding processes.	2
	Welded joint quality - discontinuities, defects, distortions, residual stresses and degradation of mechanical properties - causes and prevention.	2
	Thermal cutting and gouging. Mechanical groove preparation.	2
	Weldability of carbon steels and aluminium alloys for shipbuilding applications.	2
	Power sources for welding and other welding equipment.	2
	Underwater welding and cutting.	2
	Welding specifications, regulations and guidelines of classification societies.	2
	Safety and health in welding and cutting. Ecological issues.	2
	List of exercises	E hours
	Demonstration of electric arc welding processes – SMAW, GMAW and TIG welding process.	1
	Demonstration of robotic GMA welding.	1
	Demonstration of submerged arc welding.	1

	Demonstration of laser beam effects on metals.	1
	Presentation of hybrid laser – arc welded joints.	1
	Presentation of friction stir welding process.	1
	Demonstration of typical weld defects.	1
	Plasma and oxy-fuel cutting and gouging.	1
	Weldability of carbon and stainless steels and 5XXX and 6XXX aluminium alloys.	1
	Presentation of electric arc power sources for welding.	1
	Presentation of underwater welding.	1
	Safety and health in welding and cutting. Ecological issues.	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	Mandatory minimum attendance: 70 % for the lectures and 85 % for lab exercises. Approved reports from every lab exercise. erformed 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	0,5
	Experimental work		Report		Individual work	1
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	

Grading and evaluating student work in class and at the final exam	In order to take the exam students are obliged to regulary attend lectures (> 70 %) and lab exercises and to prepare written reports from every lab excercise. There are two written midterm or partial exams in regular and officially announced terms during the semester (one at the middle and the other at the end of the semester). Midterm exams encompass approximately one half of welding course topics. Students who successfully complete both midterm exams (more than 50 %) are administered to and have to satisfy a short oral examination. Unsuccessful termination of one or both partial exams qualifies students for final written in regular summer or fall exam terms and oral check. Grade is formed upon the success on midterm partial written exams or on final written exam and upon success on short oral examination. For 50 % to 61 % successfully and satisfactorly adopted knowledge grade (2) or sufficient is earned for 62 % to 74 % grade (3) or good, for 75 % to 87 % grade (4) or very good and over 88 % grade (5) or excellent is administered. Regularity of student's attendance of lectures and exercises and quality of laboratory exercises reports can improve the final grade.

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Anzulović, B.: Zavarivanje, FESB Split 1990.		
	S. Kralj i Š. Andrić: Zavarivanje i srodni postupci, FSB Zagreb 1999.		
	Gojić, M.: Tehnike spajanja i razdvajanja materijala, MF Sisak, 2008.		
	Lukačević, Z.: Zavarivanje, SF Slavonski Brod 1997.		
	Krnić, N.: Handouts, unpublished, - 2016.		

Optional literature (at the time of submission of study programme proposal)	Various books, handbooks, conference proceedings, manuals, journals as Schweissen und Schneiden, Welding Journal, Soudage et Techniques Connexes and manufacturer information and relevant and distinguished web documents in Croatian and English: Welding Handbook, Vol. 1 - 4, Welding Technology, Welding Processes, Materials and Applications, American Welding Society, 1992.
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. phase 1, 2008. phase 2
Total square area in m^2	29.477

3.2. List of teachers and associate teachers

Course	Teachers and associate teachers
Communication Skills	Mirjana M. Kovač, Ph.D., Assistant Professor
Communication Skills In English	Mirjana M. Kovač, Ph.D., Assistant Professor Nina Sirković, Ph.D., Assistant Professor
Computer-Aided Analysis	Damir Vučina, Ph.D.,Full Professor Igor Pehnec, Ph.D., Asistant Professor Ivo Marinić- Kragić, Teaching assistant
Computer Aided Design	Gojko Magazinović, Ph. D., Full Professor
Electrical Drives	Božo Terzić, Ph. D., Full Professor Marin Despalatović, Ph. D., Assistant Professor Goran Majić, Ph. D.
Electrical Engineering and Electronics	Ivan Marinović, Ph.D., Full Professor Ivica Jurić-Grgić, Ph.D., Associate Professor Duje Čoko,Ph.D,, Teaching assistant Nedjeljka Grulović– Plavljanić, Teaching assistant Ivan Krolo, Teaching assistant
Engineering Graphics 1	Željko Domazet, Ph.D., Full Professor Miro Bugarin, Ph.D., Assistant Professor, Ivan Špar, Teaching assistant Dejan Bobić, Teaching assistant, Joško Kunac, Teaching assistant, Petra Bagavac, Teaching assistant
Engineering Graphics 2	Tonči Piršić, Ph.D., Associate Professor Petra Bagavac, Teaching assistant Miro Bugarin, Ph.D. Assistant Professor Ivan Špar, Teaching assistant Joško Kunac, Teaching assistant Dejan Bobić, Teaching assistant
English Language 1	Daniela Matić, Ph.D., Assistant Professor

English Language 2	Daniela Matić, Ph.D., Assistant Professor
Fluid Mechanics	Zoran Milas, Pf.D., Full Professor
Fundamentals of Manufacturing Processes	Nikša Krnić, PhD, Associate professor Branimir Lela, PhD, Associate professor Jure Krolo, Teaching Assistant Domagoj Kojundžić, Teaching Assistant
Introduction To Public Speaking	Mirjana M. Kovač, Ph.D., Assistant Professor
Introduction To The Thermodynamics	Sandro Nižetić, Ph. D., Associate Professor Ivan Tolj, Ph. D., Teaching assistant Dario Bezmalinović, Ph. D., Teaching assistant
Machine Elements	Srdjan Podrug, Ph.D., Associate professor Vjekoslav Tvrdić, Teaching assistant
Marine Floating Objects	Branko Blagojević, Ph. D., Full Professor
Marine Machinery And Devices	Gojmir Radica, Ph. D., Full Professor Dario Bezmalinović, Ph. D., Teaching assistant Ivan Tolj, Ph. D., Teaching assistant Tino Sumić, Teaching assistant
Materials 1	Nikša Krnić, PhD, Associate professor Dražen Živković, PhD, Professor
Mathematics 1	Ivan Slapničar, Ph.D., Full Professor, Anita Matković, Ph.D., Associate Professor, Josipa Barić, Ph.D., Assistant Professor Ph.D. Nevena Jakovčević Stor, Irena Bego, Anita Carević, Marija Čatipović, Lea Dujić, Ivana Grgić, Lana Periša, Marina Mandić, Dajana Radišić, Mirjana Strukan, Stjepan Vedran Vukasović, Vanja Županović
Mathematics 2	Ivan Slapničar, Ph.D., Full Professor, Anita Matković, Ph.D., Associate Professor, Josipa Barić, Ph.D., Assistant Professor Ph.D. Nevena Jakovčević Stor, Irena Bego, Anita Carević, Marija Čatipović, Lea Dujić, Ivana Grgić, Lana Periša, Marina Mandić, Dajana Radišić, Mirjana Strukan, Stjepan Vedran Vukasović, Vanja Županović
Mathematics 3	Ivan Slapničar, Ph.D., Full Professor, Anita Matković, Ph.D., Associate Professor, Josipa Barić, Ph.D., Assistant Professor Ph.D. Nevena Jakovčević Stor, Irena Bego, Anita Carević, Marija Čatipović, Lea Dujić, Ivana Grgić, Lana Periša, Marina Mandić, Dajana Radišić, Mirjana Strukan, Stjepan Vedran Vukasović, Vanja Županović
Mechanics 1	Vedrana Cvitanić, Ph.D., Associate Professor

	Marko Vukasović, Ph.D., Teaching assistant Maja Kovačić, Teaching assistant
Mechanics 2	Željan Lozina, Ph.D., Full Professor Ivan Tomac, Ph.D., Assistant Professor
Mechanics 3	Željan Lozina, Ph.D., Full Professor Damir Sedlar, Ph.D., Assistant Professor Ivan Tomac, Ph.D., Assistant Professor
Mechanics of Materials 1	Frane Vlak, Ph.D., Associate Professor Marko Vukasović, Ph.D., Teaching assistant Branka Bužančić Primorac, Ph.D., Teaching assistant Maja Kovačić, Teaching assistant
Mechanics of Materials 2	Frane Vlak, Ph.D., Associate Professor Marko Vukasović, Ph.D., Teaching assistant
Noise And Vibration Control	Željan Lozina, Ph.D., Full Professor Damir Sedlar, Ph.D., Assistant Professor
Numerical Methods in Shipbuilding	Dario Ban, Ph. D., Assistant Professor Boris Ljubenkov, Ph. D., Associate Professor
Probability and Statistics	Ante Rozga, Ph.D., Full 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 Josip Bašić, Teaching assistant Klement Jadrešić, Teaching assistant
Ship equipment	Boris Ljubenkov, Ph. D., Associate Professor
Ship Geometry	Dario Ban, Ph. D., Assistant Professor Josip Bašić, Teaching assistant
Ship Hydrostatics and Stability	Dario Ban, Ph. D., Assistant Professor
Ship Resistance and Propulsion	Branko Blagojević, Ph. D., Full Professor Josip Bašić, Teaching assistant
Ship Structural Design	Branko Blagojević, Ph. D., Full Professor Paul Jurišić, Ph. D., Teaching assistant
Shipbuilding Materials	Nikša Krnić, Ph. D., Associate professor
Shipbuilding Technology	Boris Ljubenkov, Ph. D., Associate Professor
Shipyard Organization And Management	Boris Ljubenkov, Ph. D., Associate Professor
Small Ships Propulsion	Dario Ban, Ph. D., Assistant Professor Branko Blagojević, Ph. D., Full Professor
Welding in Shipbuilding	Nikša Krnić, Ph.D., Associated professor

3.3. Curriculum vitae of the course teacher

First and last name and title of teacher	**Mirjana M. Kovač, Ph.D., Assistant Professor**
The course he/she teaches in the proposed study programme	Communication Skills, Communication Skills in English, Introduction to Public Speaking
GENERAL INFORMATION ON COURSE TEACHER	
Address	Put sv. Lovre 35, 21215 Kaštel Lukšić
Telephone number	021 305715
E-mail address	Mirjana.kovac@fesb.hr
Personal web page	
Year of birth	1971
Scientist ID	297 640
Research or art rank, and date of last rank appointment	Research Associate
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant Professor, February, 2012
Area and field of election into research or art rank	Humanities and Social Sciences; Philology
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Split
Date of employment	June, 2006
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Communication skills, speech production and speech disfluencies, communication strategies
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Philosophy, University of Zagreb
Place	Zagreb
Date	10th March, 2010
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German (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	Communication Skills (Undergraduate Study of Electrical Engineering; Undergraduate Study of Computing)

where it is/was offered, and level of study programme)	
Authorship of university/faculty textbooks in the field of the course	1.Kovač, M.M.; Sirković, N. Presentation, Writing and Interpersonal Communication Skills. FESB, Split, 2014. 2.Kovač, Mirjana M.; Sirković, Nina. Strategije rješavanja poteškoća u komunikaciji na stranom jeziku. Hrvatska sveučilišna naklada, Zagreb (2015)
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1.Kovač, Mirjana Matea; Sirković, Nina. Peer Evaluation of Oral Presentations in Croatia. // *English Language Teaching*. 5 (2012) , 7; 8-17 (scientific paper). 2.Kovač, Mirjana Matea. Utjecaj kognitivne složenosti zadatka na samoispravljanja. // *Linguistica Copernicana*. 5 (2011) , 1; 269-300 (scientific paper). 3.Kovač, Mirjana Matea; Horga, Damir. Ponavljanja kao oblik govorne disfluentnosti. // *Linguistica Copernicana*. 5 (2011) , 1; 245-267 (scientific paper). 4. Kovač, Mirjana Matea. The Influence of Task Type on Perceived Fluency. // *Studies in English Language Teaching.* 4 (2016), 2; 241-253 (scientific paper). 5. Kovač, Mirjana Matea. Repetition as a Communication Strategy. // *Studies in English Language Teaching.* 4 (2016), 1; 87-104 (scientific paper).
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1.Kovač, Mirjana Matea; Sirković, Nina. Peer Evaluation of Oral Presentations in Croatia. // *English Language Teaching*. 5 (2012) , 7; 8-17 (scientific paper).
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?-pedagoškekompetencije?	Graduate study program in English Language and Literature; Graduate study program in German Language and Literature
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	**Nikša Krnić, Associate Professor, Ph. D.**
The course he/she teaches in the proposed study programme	Materijals 1, Shipbuilding materials, Fundamentals of production technologies, Welding in shipbuilding
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 teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Performed, proposed and upgraded more similar or new 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	Award of the Croatian Welding Society

scholarly/artistic work	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	**Nina Sirković, Ph.D., Assistant Professor**
The course he/she teaches in the proposed study programme	Communication Skills in English Mechanical Engineering, Industrial Engineering and Naval Architecture
GENERAL INFORMATION ON COURSE TEACHER	
Address	Vukovarska 117, Split
Telephone number	+385 21 305 716
E-mail address	nina.sirkovic@fesb.hr
Personal web page	
Year of birth	1964
Scientist ID	297651
Research or art rank, and date of last rank appointment	Scientific Associate, 21 November 2012
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant Professor, 21 November 2012
Area and field of election into research or art rank	Humanities, Philology
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	1 June 2007
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Philology
Function	Head of General Course Department
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Philosophy, University of Zagreb
Place	Zagreb
Date	7 December 2010
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German (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 1 and English Language 2, Undergraduate study programme Communication Skills in English, Undergraduate study programme
Authorship of university/faculty	Kovač, Mirjana M.; Sirković, Nina (2014*). Presentation, Writing*

textbooks in the field of the course	*and Interpersonal Communication Skills.* Split, FESB. Kovač, Mirjana, M..Sirković, N.(2015) *Strategije rješavanja poteškoća u komunikaciji na stranom jeziku*. Hrvatska sveučilišna naklada, Zagreb
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	Kovač, Mirjana, Sirković, Nina, „Peer Evaluation of Oral Presentations in Croatia“, in: *English Language teaching,* Canadian Center of Science and Education, Vol. 5, No. 7, Toronto, 2012. (8-16)
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	Kovač, Mirjana Matea, Sirković Nina, Attitudes towards Communication Skills among Engineering Students, in: *English Language Teaching*, Canadian Center of Science and Education ,Vol.10, No. 3, Toronto, 2017.(111-117)
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences	University degree at the Faculty of Philology – pedagogical group
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,8

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

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

First and last name and title of teacher	**Božo Terzić, Ph.D., Full Professor**
The course he/she teaches in the proposed study programme	Electrical Drives
GENERAL INFORMATION ON COURSE TEACHER	
Address	Elemova 5, 21312 Podstrana HR
Telephone number	+385 91 4305609
E-mail address	bterzic@fesb.hr
Personal web page	
Year of birth	1962.
Scientist ID	138865
Research or art rank, and date of last rank appointment	Scientific Adviser, 9/7/2009
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 18/9/2014
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	1986.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Electrical Drives, Power Converters
Function	Head of Chair of Electrical Drives and Automation
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	25/11/1998
INFORMATION ON ADDITIONAL 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)
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Electrical drives - Professional study programme of Electrical engineering, Testing of Electrical Equipement - Graduate study programme of Power 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	1. Terzić, Božo; Despalatović, Marin; Slutej, Alojz. *Magnetization Curve Identification of Vector-Controlled Induction Motor at Low-Load Conditions*. // Automatika -

works at most)	Journal for Control, Measurement, Electronics, Computing and Communications, 53 (2012) , 3; 1-8. 2. Jadrić, Martin; Terzić, Božo; Despalatović, Marin; Majić, Goran; Slutej, Alojz; Šimić, Toni. *Identification of Rotor Resistance and Transient Inductance of Induction Motors Using Frequency Selection Criterion* // Proceedings of the 2012 XXth International Conference on Electrical Machines / Nogueiras Meléndez, Andrés A. (ur.). Marseille, Francuska : IEEE IES, 2012. 978-984. 3. Terzić, Božo; Despalatović, Marin: *Ispitivanje i procjena stanja izolacijskog sustava visokonaponskih motora u tvornicama cementa CEMEX – Kaštel Sućurac*, tijekom posljednjih 5 godina svake godine se testira približno 30 visokonaponskih motora, Naručitelj: Cemex, 2012.-2016. 4. Terzić, Božo; Despalatović, Marin; Majić, Goran; Gladina, Željko: *Mjerenja i analiza karakteristika upuštača asinkronih motora u postrojenju mlina cementa 2 u tvornici Cemex – Pogon Sv. Juraj*, Naručitelj: Siemens, 2014. 5. Terzić, Božo; Despalatović, Marin; Majić, Goran; Stergulc, Marjan; Kriletić, Ante; Šormaz, Krste: *Frequency Converter Design for High Speed Permanent Magnet Generator in Cogeneration Plants*,, Technical Journal, Scientific-professional Journal of University North, Vol. 10, No. 3-4, Croatia, 2016.
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. Domestic sceintific project: *On-line parameter identification of synchronous generator,* project leader, 2011. – 2013., funding the project: MZOŠ 2. International development project: Development of electric drives for crane systems operating in hard environment, project leader, 2008. – 2013., in cooperation with swedish company *ABB Crane Systems* that fully funded the project. 3. Researche and development project: A safer and more efficient cogeneration / trigeneration plants, project leader, 2014.-2016., project was funded from EU structural funds.
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)	From 4 to 4,8.

First and last name and title of teacher	**izv. prof. dr. sc. Marin Despalatović**
The course he/she teaches in the proposed study programme	Electrical Drives – 140 – Undergraduate Study: Naval Architecture
GENERAL INFORMATION ON COURSE TEACHER	
Address	R. Boškovića 32, HR-21000 Split
Telephone number	+385 (0)21 305 813
E-mail address	marin.despalatovic@fesb.hr
Personal web page	
Year of birth	1976.
Scientist ID	248733
Research or art rank, and date of last rank appointment	Senior scientific associate, November 22nd, 2012.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate professor, September 20th, 2016.
Area and field of election into research or art rank	Technical Sciences – Field Electrical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	May 10th, 2001.
Name of position (professor, researcher, associate teacher, etc.)	Associate professor
Field of research	Research and teaching in electrical machines and drives
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD (in Electrical Engineering)
Institution	University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	April 24th, 2009.
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Electrical Machines – 113 – Undergraduate Study: Electrical Engineering and Information Technology Modeling of Electromechanical Systems, Transients in Electrical Machines – 231, 232 – Graduate Study: Electrical Engineering

	Electrical Drives, Design of Low Voltage Facilities – 511 – Vocational Study: Electrical 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. Majić, G.; Despalatović, M.; Terzić, B.; Slutej, A.: Influence of Dead-time on Design of LCL-filter for Three-phase Voltage Source Converter, EDPE Conference Proceedings, 2013. 2. Despalatović, M.; Jadrić, M.; Terzić, B.: Modeling of Saturated Synchronous Generator Based on Steady-State Operating Data, IEEE Transactions on Industry Applications, 48(1), 2012. 3. Terzić, B.; Despalatović, M.; Slutej, A.: Magnetization Curve Identification of Vector-Controlled Induction Motor at Low-Load Conditions, Automatika, 53, 2012. 4. Jadrić, M.; Terzić, B.; Despalatović, M.; Majić, G.; Slutej, A.; Šimić, T.: Identification of Rotor Resistance and Transient Inductance of Induction Motors Using Frequency Selection Criterion, Proc. of the XXth International Conference on Electrical Machines, 2012. 5. Jadrić, M.; Despalatović, M.; Terzić, B.: Development of synchronous generator saturation model from steady-state operating data, Electric Power Systems Research, 80(11), 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)	1. Smart Grid Metrology Infrastructure, HRZZ 2. A safer and more efficient cogeneration / trigeneration facilities, co-financing EU fund for science and innovation 3. Development of electrical drives for large industrial cranes working in heavy duty conditions, collaboration with ABB Crane Systems 4. On-line parameter identification of synchronous generator, MZOŠ 5. State and parameter estimation of electrical machines, MZT
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences.	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	Evaluation organizer University of Split Scale from 2 (sufficient) to 5 (excellent) Course: Electrical Drives – 511, average grade 4.0 Electrical Machines – 113, average grade 4.2 Modeling of Electromechanical Systems – 231, average grade 4.5

First and last name and title of teacher	**Ivan Marinović, Ph.D., Full Professor**
The course he/she teaches in the proposed study programme	ELECTRICAL ENGINEERING AND ELECTRONICS
GENERAL INFORMATION ON COURSE TEACHER	
Address	Butor dolac 13, 21405 Milna, o. Brač
Telephone number	098 1835911
E-mail address	imarin@fesb.hr
Personal web page	www.fesb.hr/~imarin
Year of birth	1966.
Scientist ID	200263
Research or art rank, and date of last rank appointment	Scientific Advisor, 20.06.2016.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full Professor, 15.07.2016.
Area and field of election into research or art rank	Technical Sciences, Electrical Engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split
Date of employment	21.02.1991.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Electronics, Radiocommunications
Function	Head of Cathedra for Radiocommunication Circuits and Systems
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture – Split
Place	Split
Date	12.05.2005.
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (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)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Electronic Circuits, Graduate study programme, Electronic Circuits and Measurements, Graduate study programme
Authorship of university/faculty	Marinović, Ivan; Čoko, Duje, Električki sklopovi-Upute za

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

First and last name and title of teacher	**Željko Domazet, Ph.D., Full Professor**
The course he/she teaches in the proposed study programme	Metal structures, Engineering graphics 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	L. Krstulović-O., Ž. Domazet: Dizajn industrijskih proizvoda

textbooks in the field of the course	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	„Training for administrative and educational personnel“ part of the EU project ME4CataLOgue (Mechanical Engineering for Catalogue)

the methodological-psychological-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	**Tonči Piršić, Ph.D., Associate professor**
The course he/she teaches in the proposed study programme	Enginering graphics 2
GENERAL INFORMATION ON COURSE TEACHER	
Address	Stepinčeva 2, 21000 Split
Telephone number	021/535517
E-mail address	tpirsic@fesb.hr
Personal web page	www.fesb.hr/kk
Year of birth	1959.
Scientist ID	134894
Research or art rank, and date of last rank appointment	Higher scientific colaborator 15. 06. 2016.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate proffesor 15. 06. 2016.
Area and field of election into research or art rank	Technical science, general mechanical engineering, construction
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	01. 10. 1987.
Name of position (professor, researcher, associate teacher, etc.)	Proffesor
Field of research	Machine elements, fatigue of materials, transport in industry
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty ofMechanical Engineering and Naval Architecture
Place	Zagreb
Date	15.06. 1999.
INFORMATION ON ADDITIONAL TRAINING	
Year	2001
Place	Bologna, Italy
Institution	University of Bologna
Field of training	Fatogu of materials
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English 5
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian 3
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Professor of Enginering graphics 2 Undergraduate study programme,
Authorship of university/faculty textbooks in the field of the course	T. Piršić: Tehničko crtanje, FESB Split, 2010. T. Piršić: AutoCAD u Strojarstvu, FESB Split, 2008.

Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	T. Piršić: "Experimentally Based Method for Fatigue Life Prediction of Aluminium Welded Joints", Fatigue 99, Proceedings of the 7. International Fatigue Congress, Beijing, P.R. China, Editors X. R Wu and Z. G. Wang, pp. 1309 -1312, Volume 2/4, Higher Education Press, Beijing, P.R. China, Engineering Advisory Services Ltd, UK, 1999. ISBN 1901537080 (Rad objavljen u knjizi) Ž. Domazet, Ž. Lozina, T. Piršić: "Fatigue Damage and Repair of 250 kN Crane in Shipyard", Proceedings of the 10th International Conference on Fracture, Hawai, USA, 2001. Ž. Domazet, T. Piršić: "Fatigue Failures in industry – Case Studies", Proceedings of the 7th International Design Conference, Vol. 2., pp. 1153-1158, ISBN 953-6313-47-9, Dubrovnik, 2002. Ž. Domazet, T. Piršić, M. Stupalo: "Fatigue Damages and Repair of a Cement Mill Gear Wheel", Proceedings of 4th International Congress of Croatian Society of Mechanics, pp. 145-151, ISBN 953-96243-4-7, Bizovac, Croatia, 2003.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-	
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	**Daniela Matić, Ph.D., Assistant Professor**
The course he/she teaches in the proposed study programme	English Language 1; English Language 2
GENERAL INFORMATION ON COURSE TEACHER	
Address	Matice hrvatske 23, 21000 Split
Telephone number	098/ 1766010
E-mail address	daniela.matic@fesb.hr
Personal web page	/
Year of birth	1967
Scientist ID	332846
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	Assistant professor; January 23, 2013
Area and field of election into research or art rank	Humanities; philology
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	November 11, 2005
Name of position (professor, researcher, associate teacher, etc.)	English teacher
Field of research	ESP, pragmatics, discourse analysis, contact linguistcs
Function	/
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	Faculty of Humanities and Social Sciences, University of Zagreb
Place	Zagreb
Date	December 12, 2011
INFORMATION ON ADDITIONAL TRAINING	
Year	1998
Place	Barnstaple, Velika Britanija
Institution	Services for Open Learning, Barnstaple, Inservice Course in Teacher Training
Field of training	English language teaching methodology
Year	2002.
Place	Gyula, Hungary
Institution	A.S.Hornby International Trust, British Council, "Teaching English through Culture"
Field of training	English language teaching methodology
Year	2003
Place	Krakow, Poland
Institution	A.S.Hornby International Trust, British Council, "Intercultural Studies on the Web: Methodology and Materials"
Field of training	English language teaching methodology
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	French; 5

from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian; 3
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent	German; 2
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Course teacher of : - English Language 1, 2 and 3 courses at undergraduate studies of Computer Science, Electrical Engineering and IT and Naval Architecture; - English Language 1 and 2 courses at professional studies of Computer Science, Electrical Engineering and IT and Naval Architecture; - English Language for Academic purposes at graduate studies of 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. Matić, Daniela. (2012). Zamjenice u hrvatskim političkim govorima. *Filolog: časopis za jezik, književnost i kulturu*. V/2012, Univerzitet u Banjoj Luci, Filološki fakultet, ISSN 1986-5864. 2. Matić, Daniela. (2012). Jezične igre moći u drami Who's Afraid of Virginia Woolf? Edwarda Albeeja. *LINGUA MONTENEGRINA časopis za jezikoslovna, književna i kulturna pitanja,* god. V/2, br. 10. (2012). Podgorica: Institut za crnogorski jezik i književnost. ISSN 1800-7007. 3. Matić, Daniela. (2012). Ideological Discourse Structures in Political Speeches. *Komunikacija i kultura online. Elektronski časopis za jezik, komunikaciju i kulturu*. Godina III. Broj 3. http://www.komunikacijaikultura.org/KK3.html Beograd: FOKUS – Forum za interkulturnu komunikaciju. e-ISSN 2217-4257 (Online) UDC 8:008:316.7 4. Matić, Daniela. (2013). Pronouns in American Political Speeches. *LINGUA MONTENEGRINA časopis za jezikoslovna, književna i kulturna pitanja*, god. VI/1 br. 11. (2013). Podgorica: Institut za crnogorski jezik i književnost. ISSN 1800-7007. 5. Matić, Daniela, Nataša Stojan. (2013). Rodne oznake u oglasima za posao. Kroz jezike i kulture ; Across Languages and Cultures - *Zbornik radova sa Treće međunarodne konferencije Instituta za strane jezike (ICIFL3) i Treće međunarodne konferencije o interkulturnoj komunikaciji* / Lakić, Igor ; Kostić, Nataša (ur.). - Podgorica : Institut za strane jezike / Institute of Foreign Languages, 2013. 59-69 ISBN: 978-86-85263-10-1. 6. Matić, Daniela. (2014). Ideology Hidden in the Form of Croatian and American Political Speeches. *Teme. Časopis za društvene nauke.* Br.3 (2014). Niš: Univerzitet u Nišu. ISSN 0353-7919.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Matić, Daniela. (2014). Attitudes of computer science students to the English element in Croatian ICT magazines. *ESP Today. Journal of English for Specific Purposes at Tertiary Leve*l. Volume 2, Issue 2 (2014). http://www.esptodayjournal.org/index.html e-ISSN 2334-9050. 2. Matić, Daniela. (2015). Percepcija hrvatskih studenata

	računarstva o prihvatljivosti engleskoga elementa u glagolima, glagolskim imenicama i jukstaponiranim leksičkim segmentima u hrvatskim tekstovima iz područja računalnih i komunikacijskih tehnologija. *Od teorije do prakse u jeziku struke - Zbornik radova s 3. stručno-znanstvenog skupa Udruge nastavnika jezika struke na visokoškolskim ustanovama.*/ Cigan, Vesna; Omrčen, Darija (ur.) – Zagreb: Udruga nastavnika jezika struke na visokoškolskim ustanovama, 2015. 65-81.
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	Students' attitudes toward the English element in ICT terminology
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?	Regular four-year studies of the English language and literature and the French language and literature at Zagreb University.
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)	Positive

First and last name and title of teacher	**Branimir Lela, PhD, Assistant Professor**
The course he/she teaches in the proposed study programme	Fundamentals of technologies
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. Technology of metal processing (540) **Graduate study:** 1. Tools and fixtures (263,261,271,272) **Postgraduate study**: 1. Processing by deformation (330)
Authorship of university/faculty textbooks in the field of the course	- Manual for laboratory exercise in processing by deformation - Manual for laboratory exercise in heat treatment
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Jozić, Sonja; Lela, Branimir; Bajić, Dražen. **A New Mathematical Model for Flank Wear Prediction Using Functional Data Analysis Methodology**. *Advances in Materials Science and Engineering*. **2014** (2014) ; 1-8 2. Lela, Branimir; Musa, Ante; Zovko, Oliver. **Model-based controlling of extrusion process**. *International journal of advanced manufacturing technology*. **74** (2014) , 9-12; 1267-1273 3. Krstić Vukelja, Elizabeta; Duplančić, Igor; Lela, Branimir. **Continuous roll casting of aluminium alloys– casting parameters analysis**. *Metalurgija*. **49** (2010) , 2; 115-118 4. Cvitanić, Vedrana; Ivandić, Daniel; Lela, Branimir. **Comparison of orthotropic constitutive models in predicting square cup deep drawing process of AA2090-T3 sheet** . *Proceedings of 4th International Conference Mechanical Technologies and Structural Materials 2014* / Živković, Dražen (ur.). Split : Croatian society for mechanical technologies, 2014. 61-70 5. Duplancic, Igor; Lela, Branimir; Musa, Ante; Zovko, Oliver. **Functional Data Analyses in Control of Extrusion Process**. *Proceedings of the Tenth International Aluminum Extrusion Technology Seminar*. Wauconda, Illinois, USA : ET Foundation, 2012. 655-663
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. Improving the properties and methods of processing aluminium alloys Project manager: prof. dr. sc. Igor Duplančić, Time period: 2007.-2014. Financing: MZOŠ 2. Parameters optimization and prediction of results of metal heat treatment Project manager: prof. dr. sc. Božo Smoljan, Time period: 2014.- Financing: HRZZ
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-	Training for teachers and administrative staff within EU project ME4CataLOgue

didactic-pedagogical group of competences?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4.7/5

First and last name and title of teacher	**Sandro Nižetić, Ph. D., Associate Professor**
The course he/she teaches in the proposed study programme	Introduction to the Thermodynamics
GENERAL INFORMATION ON COURSE TEACHER	
Address	Slovenićeva 5, 21000, Split
Telephone number	+385914305954
E-mail address	snizetic@fesb.hr
Personal web page	
Year of birth	03.06.1980.
Scientist ID	272991
Research or art rank, and date of last rank appointment	
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	izv.prof., December 18, 2013.
Area and field of election into research or art rank	Technical sciences, Thermodynamics.
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	01/03/2003.
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	Thermodynamics, Energy Efficiency, Energy Conversion, Renewable energy.
Function	Head of Laboratory for Thermodynamics and Energy Efficiency
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	12/02/2009
INFORMATION ON ADDITIONAL TRAINING	
Year	2016.
Place	USA
Institution	Florida solar energy research centre
Field of training	Renewable energy, energy efficiency in buildings.
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Thermodynamics 1 and 2 (undergraduate study programme), Heat and mass transfer (graduate study programme), rational use of energy (graduate study programme).

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

carried out in the last five years (5 at most)	Croatia'', Project Coordinator for the Dalmatian region, -2007. – 2013.- Research project (023-0231751-3011), "New aspect of solar energy utilization in solar chimney power plants, Head of the scientific project, Ministry of Science, Education and Sports. -2003. - 2006., Research project (0023013), "Significant reduction of chimney height in solar chimney power plants", Researcher, Ministry of Science, Education and Sports. -2015.-to date-Research of the ice based floating structures, cooperation with DIV company.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,8/5.0

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

	transient analysis using the improved transmission line model based on the finite element method", ETEP: European Transactions on Electrical Power, Vol.23 (2), 2013, pp. 282–289. • Dabro, M.; Jurić-Grgić, I.; Martinović, M.: "Improvement of Synchronous Generator Power Stability Using Hydraulic Digital Governor", International Journal on Engineering Applications (IREA), Vol. 1 (5), 2013, pp. 263-267. • Dabro, M.; Jurić-Grgić, I.; Lucić, R.: "Optimization of Hydraulic Digital Governor parameters using EMTP-RV", International Journal on Engineering Applications (IREA), Vol. 1 (2), 2013, pp. 90-93. • Dabro, M.; Jurić-Grgić, I.; Lucić, R.: "EMTP-RV Model of Hydraulic Digital Governor", International Review on Modelling and Simulations (IREMOS), Vol. 4 (6), 2011, pp. 1-5.
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	-
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	• Study: Elaborat iznošenja potencijala i izračun napona dodira i koraka za EVP 110/25 kV Novska, Naručitelj: Projektni biro Split, 2010. • Project: 023 0231581-1610, "Numeričko modeliranje elektroenergetskog sustava tehnikom konačnih elemenata", br. 023 0231581-1610, Ministarstvo znanosti, obrazovanja i športa Republike Hrvatske, 2007.-2011. • Study: Izrada pravila i mjera sigurnosti za osiguranje mjesta rada na elektroenergetskim vodovima, Naručitelj: HEP OPS d.o.o., Prijenosno područje Split, 2013.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	-
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	-
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	-

First and last name and title of teacher	**Damir Vučina, Ph.D., Full Professor**
The course he/she teaches in the proposed study programme	Computer aided analysis
GENERAL INFORMATION ON COURSE TEACHER	
Address	FESB, R. Boškovića 32, 21000 Split
Telephone number	021 305 969
E-mail address	vucina@fesb.hr
Personal web page	
Year of birth	1962
Scientist ID	129716
Research or art rank, and date of last rank appointment	Scientific Adviser, 2005
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 2005
Area and field of election into research or art rank	Technical Sciences, Fundamental Technical Sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	1985
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Numerical methods in engineering and optimization
Function	Head of group for modeling and computer-aided analysis
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Fakultet strojarstva i brodogradnje
Place	Zagreb
Date	1993
INFORMATION ON ADDITIONAL TRAINING	
Year	Fulbright grant, Columbia University New York Several courses at CISM Italy
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German (5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Computer.aided analysis Optimization methods Programming Graduate courses
Authorship of university/faculty	D. Vučina, 'Metode inženjerske numeričke optimizacije',

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

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 (FESD06)
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	Course teacher of courses: • Machine elements 1 and Machine elements 2 / undergraduate university study Mechanical engineering; • Machine elements / undergraduate university study Naval

study programme)	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?-	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	**Gojmir Radica, Ph. D., Full Professor**
The course he/she teaches in the proposed study program	Marine engineering, Marine propulsion systems, Propulsion system of small ships, Marine machinery and devices
GENERAL INFORMATION ON COURSE TEACHER	
Address	Tolstojeva 43, 21000 Split
Telephone number	021 305955
E-mail address	gojmir.radica@fesb.hr
Personal web page	https://nastava.fesb.unist.hr/nastava/nastavnici/detalji/goradica
Year of birth	1962
Scientist ID	245370
Research or art rank, and date of last rank appointment	15.9.2010. scientific adviser
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	20.03.2013. Full professor
Area and field of election into research or art rank	Technical science, mechanical engineering, marine engineering
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of electrical engineering mechanical engineering and naval architecture
Date of employment	1.10.2011.
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Thermodynamic machines, marine engineering
Function	Professor
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Doctor of Science in Mechanical Engineering
Institution	Postgraduate Studies, Faculty of Mechanical Engineering and Naval Architecture - University of Zagreb
Place	Zagreb
Date	21.06.2004.
INFORMATION ON ADDITIONAL TRAINING	
Year	1992
Place	Split, Croatia
Institution	Maritime faculty University of Split, Croatia
Field of training	Marine engineer
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English - 5
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian- 3
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German- 3
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of 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

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	**Ivan Slapničar, Ph.D., Full Professor,**
The course he/she teaches in the proposed study programme	Mathematics 1, Mathematics 2, Mathematics 3
GENERAL INFORMATION ON COURSE TEACHER	
Address	FESB, R. Boškovića 32, B803
Telephone number	021 305893
E-mail address	Ivan.slapnicar@fesb.hr
Personal web page	http://www.fesb.hr/~slap
Year of birth	1961
Scientist ID	30650
Research or art rank, and date of last rank appointment	Scientific counselor
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full professor, permanent position, since 2008
Area and field of election into research or art rank	Area of Natural Sciences, field of Mathematics
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	FESB, Split
Date of employment	1985
Name of position (professor, researcher, associate teacher, etc.)	Full Professor
Field of research	Mathematics
Function	Head of the Chair of Mthematics
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Dr. sc. (dr. rer. Nat.)
Institution	Fernunuversitas Hagen
Place	Hagen, Germany
Date	October 1992
INFORMATION ON ADDITIONAL TRAINING	
Year	2014
Place	Cambridge, MA, USA
Institution	Massachusetts Institute of Technology
Field of training	Fulbright-Schuman International Educator/Lecturer Grant
Year	2009/2010
Place	Berlin, Germany
Institution	Technische Universität Berlin
Field of training	FP7 People "Marie Curie" Intra European Fellowship
Year	2001/2002
Place	Logan, UT, SAD
Institution	Utah State University
Field of training	Visiting Professor of Mathematics
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	German (5)

Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	
Authorship of university/faculty textbooks in the field of the course	Ivan Slapničar, Matematika 1, FESB, Split, 2002. (udžbenik Sveučilišta u Splitu) Ivan Slapničar, Josipa Barić i Marina Ninčević, Matematika 2 – zbirka zadataka, FESB, Split, 2010. (udžbenik Sveučilišta u Splitu)
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Jakovčević Stor, Nevena; Slapničar, Ivan; Barlow, Jesse L. Accurate eigenvalue decomposition of real symmetric arrowhead matrices and applications. // Linear algebra and its applications. 464 (2015) ; 62-89 (članak, znanstveni) 2. Slapničar, Ivan. Symmetric matrix eigenvalue techniques // Handbook of linear algebra / Hogben, Leslie (ur.). Boca Raton ; London ; New York : Chapman & Hall / CRC, 2013. Str. 55-1-55-23. 3. Slapničar, Ivan. On the spectra of generalized Fibonacci and Fibonacci-like operators. // Operators and Matrices. (2012) , 1; 49-62 (članak, znanstveni). 4. Krstinić, Damir; Kuzmanić Skelin, Ana; Slapničar, Ivan. Fast Two-Step Histogram-Based Image Segmentation. // IET image processing. 5 (2011) , 1; 63-72 (članak, znanstveni) 5. Krstinić, Damir; Slapničar, Ivan. Grid-Based Mode Seeking Procedure. // Intelligent Data Analysis An International Journal. 15 (2011) , 3; 343-356 (članak, znanstveni).
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. Accurate and fast matriox algorithms and applications, project MZOS No. 372783-1289, 2007- 2013, principal investigator. 2. Optimization of parameter dependent mechanical systems, HRZZ research project No. 9540, 2015-2019, collaborator.
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	Fernunivesität Hagenu award for best dissertation, 1992. Croatian mathematical society award for young scientists for scientific contribution in mathematics, 1996.
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	**Anita Matković, Ph.D., Associate Professor**
The course he/she teaches in the proposed study programme	Mathematics 3
GENERAL INFORMATION ON COURSE TEACHER	
Address	FESB, R. Boškovića 32, B804
Telephone number	021 305894
E-mail address	anita.matkovic@fesb.hr
Personal web page	https://nastava.fesb.hr/nastava/nastavnici/detalji/amatkovi
Year of birth	1966
Scientist ID	180406
Research or art rank, and date of last rank appointment	higher scientific collaborator
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associate Professor, 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	2006
Name of position (professor, researcher, associate teacher, etc.)	Associate Professor
Field of research	Mathematics
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	University of Zagreb, Faculty of Science
Place	Zagreb, Croatia
Date	October 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)	Mathematics 1, Mathematics 2, Mathematics 3, Mathematics – selected topics, undergraduate studies of electrical engineering, mechanical engineering and naval archicecture.
Authorship of university/faculty textbooks in the field of the course	
Professional, scholarly and artistic	1. Matković, A., Generalization of the Jensen-Mercer

articles published in the last five years in the field of the course (5 works at most)	inequality by Taylor's polynomial, Mathematical Inequalities and Applications, 19 (2016), 4; 1387-1398. 2. Matković, A.; Pečarić, Josip.; Perić, J., A refinement of the Jessen-Mercer inequality and a generalization on convex hulls in R^k, Journal of Mathematical Inequalities 9 (2015), 4; 1093-1114.
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. Convex functions and applications, project MZOS No. 177-1170889-1207, 2007- 2015, collaborator. 2. 2. Inequalities and Applications , HRZZ research project No. 5435, 2014- , collaborator.
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?	Graduate teachers study of mathematics and informatics, University of Split, Faculty of Science.
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)	Evaluations organized by the Quality Enhancement Centre of the University of Split each semester. Average grade is 4.4 on the 1-5 scale.

First and last name and title of teacher	**Josipa Barić, Ph.D., Assistant Professor**
The course he/she teaches in the proposed study programme	Mathematics 1, Mathematics 2, Mathematics 3,
GENERAL INFORMATION ON COURSE TEACHER	
Address	FESB, R. Boškovića 32, B809
Telephone number	021 305899
E-mail address	josipa.baric@fesb.hr
Personal web page	
Year of birth	1974.
Scientist ID	248871
Research or art rank, and date of last rank appointment	scientific assistant
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Assistant professor, permanent position, 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.)	Assistant professor
Field of research	Mathematics
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	Ph.D.
Institution	PMF
Place	Zagreb
Date	January 2011.
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
Year	
Place	
Institution	
Field of training	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (5)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	

COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Lecturer of various courses since 2001.
Authorship of university/faculty textbooks in the field of the course	Ivan Slapničar, Josipa Barić i Marina Ninčević, Matematika 2 – zbirka zadataka, FESB, Split, 2010. (Manualia Universitatis studiorum Spalatensis) Barić, Josipa; Bibi, Rabia; Bohner, Martin; Nosheen, Ammara; Pečarić, Josip. Jensen Inequalities on Time Scales, Theory and Applications . Zagreb : Element, 2015
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Barić, Josipa; Jakšić, Rozarija; Pečarić, Josip. Converses of Jessen's inequality on time scales II. // Mathematical inequalities & applications. 19 (2016) , 4; 1271-1285. 2. Barić, Josipa; Bohner, Martin; Jakšić, Rozarija; Pečarić, Josip. Converses of Jessen's inequality on time scales. // Mathematical notes. 98 (2015) , 1; 11-24. 3. Barić, Josipa; Nosheen, Ammara; Pečarić, Josip. Time scale Hardy-type inequalities with general kernel for superquadratic functions. // Proceedings of A. Razmadze Mathematical Institute. 165 (2014) ; 1-18, 4. Barić, Josipa; Bibi, Rabia; Bohner, Martin; Pečarić, Josip. Time scales integral inequalities for superquadratic functions. // Journal of the Korean Mathematical Society. 50 (2013) , 3; 465-477
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course	Evaluations organized by the Quality Enhancement Centre of the University of Split each semester. Average grade is 4.5 on the 1-5 scale.

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	Mechanics 1
GENERAL INFORMATION ON COURSE TEACHER	
Address	Lovretska 19, 21000 Split, Hrvatska
Telephone number	021-305-970
E-mail address	vcvit@fesb.hr
Personal web page	
Year of birth	1970.
Scientist ID	233760
Research or art rank, and date of last rank appointment	Scientific Adviser, 11/5/2011
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Associated Professor, 19/7/2012
Area and field of election into research or art rank	Technical Sciences, Field Basic Technical Sciences
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	22/09/1995
Name of position (professor, researcher, associate teacher, etc.)	Associated Professor
Field of research	Theory of plasticity, Continuum mechanics
Function	
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Place	Split
Date	19/05/2006
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	
Institution	
Field of training	
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme 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	**Željan Lozina, Ph.D., Full Professor**
The course he/she teaches in the proposed study programme	Mechanics 2, Mechanics3
GENERAL INFORMATION ON COURSE TEACHER	
Address	Rendićeva 18
Telephone number	021-305-968
E-mail address	zeljan.lozina@fesb.hr
Personal web page	http://marjan.fesb.hr/~lozina/
Year of birth	1956.
Scientist ID	96925
Research or art rank, and date of last rank appointment	Scientific Adviser, 21.06.2000.
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Senior Full Professor, 09.03.2005.
Area and field of election into research or art rank	Engineering Sciences, Field Engineering mechanics
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Date of employment	22.10.1982
Name of position (professor, researcher, associate teacher, etc.)	Professor
Field of research	Dynamics/Vibration, Numerical methods, FEM
Function	Head of Chair of Dynamics and Vibration
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	FSB – Univerity of Zagreb
Place	Zagreb
Date	05.04.1989.
INFORMATION ON ADDITIONAL TRAINING	
Year	
Place	Udine, Italy
Institution	CISM
Field of training	Engineering Mechanics
MOTHER TONGUE AND FOREIGN LANGUAGES	
Mother tongue	Croatian
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	English (4)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	Italian (3)
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	French (2)
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	Mechanics of materials, Programming, Mechanisms, Vehicle (ship) systems,…
Authorship of university/faculty textbooks in the field of the course	Finte element method, Univerity of Split

	Kinematics, Univerity of Split Dynamics, Univerity of Split Programming, Univerity of Split
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. 1. Sedlar, Damir; Lozina, Željan; Vučina, Damir: An implementation of structural change detection procedure based on experimental and numerical model correlation. // Journal of sound and vibration. 331 (2012) , 13; 3068-3082 2. Vučina, Damir; Lozina, Željan; Pehnec, Igor.: Ad-Hoc Cluster and Workflow for Parallel Implementation of Initial-Stage Evolutionary Optimum Design. // Structural and multidisciplinary optimization. 45 (2012) , 2; 197-222 3. Vučina, Damir; Lozina, Željan; Pehnec, Igor.: Computational procedure for optimum shape design based on chained Bezier surfaces parameterization. // Engineering applications of artificial intelligence. 25 (2012) , 3; 648-667 4. Vučina, Damir; Lozina, Željan; Vlak, Frane.: NPV-based decision support in multi-objective design using evolutionary algorithms. // Engineering applications of artificial intelligence. 23 (2010) , 1; 48-60 5. Lozina, Željan; Sedlar, Damir; Vučina, Damir.: Model Update with Observer/Kalman Filter and Genetic Algorithm Approach. // Transactions of FAMENA. 36 (2012)
Professional and scholarly articles published in the last five years in subjects of teaching methodology and teaching quality (5 works at most)	1. Cvitanić, Vedrana; Duplančić, Igor; Lozina, Željan; Ivandić, Daniel.:Earing predictions for Al2008-T4 sheet. // Aluminium and its alloys. 3 (2011) ; 73-77 2. Sedlar, Damir; Lozina, Željan; Vučina, Damir. 3. Comparison of Genetic and Bees Algorithm in the Finite Element Model Update. // Transactions of FAMENA. 35 (2011) , 1; 1-12
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. HRZZ Istraživački projekt: Mjeriteljska infrastruktura za pametne mreže, 2015. - 2018. 2. LLP - ERASMUS: Strategic Alignment of Electrical and Information Engineering in European Higher Education Institutions, 2012. -2014. 3. TEMPUS: Creation of the third cycle studies-doctoral studies in metrology Trajanje projekta: 2010. – 2013.
The name of the programme and the volume in which the main teacher passed exams in/acquired the methodological-psychological-didactic-pedagogical group of competences?-pedagoške kompetencije?	Me4
PRIZES AND AWARDS, STUDENT EVALUATION	
Prizes and awards for teaching and scholarly/artistic work	
Results of student evaluation taken in the last five years for the course that is comparable to the course described in the form (evaluation organizer, average grade, note on grading scale and course evaluated)	4,8/5

First and last name and title of teacher	**Frane Vlak, Ph. D., Associate Professor**
The course he/she teaches in the proposed study programme	Mechanics of materials 1 Mechanics of materials 2 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	Technical mechanics 1, Mechanics of materials: Professional studies of mechanical engineering and naval architecture, Undergraduate study programme Mechanics of materials: University studies of mechanical

study programme)	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)	
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	**Ante Rozga, Ph. D., Full Professor**
The course he/she teaches in the proposed study programme	Statistics, Probability and Statistics.
GENERAL INFORMATION ON COURSE TEACHER	
Address	21000 Split, 166 Vukovarska
Telephone number	021 430-649
E-mail address	rozga@efst.hr
Personal web page	http://www.efst.unist.hr/o-fakultetu/fakultet/djelatnici/osoba/detalji/rozga
Year of birth	1951
Scientist ID	057876
Research or art rank, and date of last rank appointment	Scientific adviser, 2009
Research-and-teaching, art-and-teaching or teaching rank, and date of last rank appointment	Full Professor Tenure, 2014.
Area and field of election into research or art rank	Social Sciences, Economics. Quantitative Methods.
INFORMATION ON CURRENT EMPLOYMENT	
Institution where employed	Faculty of Economics, University of Split
Date of employment	1.10. 1977.
Name of position (professor, researcher, associate teacher, etc.)	Professor.
Field of research	Quantitative Methods, Statistics. Multivariate Analysis. Survival Analysis. Statistical Methodology in Scientific Research.
Function	Professor.
INFORMATION ON EDUCATION – Highest degree earned	
Degree	PhD
Institution	Faculty of Economics.
Place	Split
Date	2001
INFORMATION ON ADDITIONAL TRAINING	
Year	1985/86
Place	London. U.K.
Institution	The London School of Economics and Political Science, Department of Statistics. Graduate studies.
Field of training	Statistics. The Analysis of Time Series.
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, 5
Foreign language and command of foreign language on a scale from 2 (sufficient) to 5 (excellent)	French, 3
COMPETENCES FOR THE COURSE	
Earlier experience as course teacher of similar courses (name title of course, study programme where it is/was offered, and level of study programme)	1. Statistics. Undergraduate studies. Faculty of Economics, University of Split. 2. Statistical Analysis. Undergraduate studies. Faculty of Economics, University of Split. 3. Biostatistics. Undergraduate and PhD studies. School

	of Medicine. University of Split. 4. Statistics. Graduate Studies. Faculty of Mechanical Engineering. University of Split. 5. Probability and Statistics. Faculty of Electrical Engineering. University of Split. 6. Statistical Methodology in Scientific Research. PhD Studies. Faculty of Economics, University of Split. 7. Multivariate Analysis. PhD Studies. Faculty of Economics, University of Split. 8. Statistical Methods in Forensics. Graduate Studies. School of Forensic Sciences. University of Split.
Authorship of university/faculty textbooks in the field of the course	1. Rozga A., (1994): *Statistička analiza*. Ekonomski fakultet Split. X+148 pages. 2. Rozga A., (2009): *Statistika za ekonomiste*. Ekonomski fakultet Split. X+336 pages. 3. Rozga A. and B. Grčić., (2009): *Poslovna statistika*. Ekonomski fakultet u Splitu. IX + 271 pages. 4. Pivac S. and A. Rozga., (2007): *Statistika za sociološka istraživanja*. Filozofski fakultet Sveučilišta u Splitu. 264 pages. 5. Pivac S. and A. Rozga., (2008): *Statistika za sociologe*. Filozofski fakultet Sveučilišta u Splitu. 231 pages.
Professional, scholarly and artistic articles published in the last five years in the field of the course (5 works at most)	1. Rozga A., E. Jurun and I. Šutalo (2013): *Correction od Chain-Linking Method by Means of Lloyd-Moulton-Fisher-Tornquist Index on Croatian GDP Data.* Croatian Operational Research Review. 2. Šerić N., A. Rozga and A. Luetić (2014): *Relationship between Business Intelligence and Supply Chain Management for Marketing Decisions.* Universal Journal of Industrial and Business Management, 2; 31-35. 3. Visković J., J. Arnerić and A. Rozga (2014): *Volatility Swiching Between Two Regimes.* International Journal of Social, Human Science and Engineering. Madrid. Spain. Madrid. ISNN: 1307-6892. Vol:9, no 3. 4. Arnerić, J., Čeh-Časni, A., Rozga, A. (2015): *Pre-adjustment Process of Real Retail Trade Series in Croatia*, The Business and Management Review, Vol. 6, No. 2, pp. 104-112, ISSN 2047-2854. 5. Poklepović, T., Aljinović, Z and Rozga, A (2016): *Moments Extraction from Implied Probability Distribution: Nonstructural Approach*. Proceedings of the 02nd International Conference on Business Management and Economics: 02nd ICBME 2016.
Professional and scholarly articles published in the last five years in	

subjects of teaching methodology and teaching quality (5 works at most)	
Professional, science and artistic projects in the field of the course carried out in the last five years (5 at most)	1. Project: *Building of Macro econometric Model of Croatian Economy*, (code of the project: 055-0551147-1146). 2. Project *Quality Assurance in Higher Education.* UNESCO.
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	**Dario Ban, Ph. D., Assistant Professor**
The course he/she teaches in the proposed study programme	Ship Geometry, Ship Hydrostatics and Stability, Project, Numerical Methods in Shipbuilding
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 professional studies of Naval Architecture (540) courses: "Ship Hull Forms", "Hydrostatics and Stability", and "Ship 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	**Boris Ljubenkov, Associate Professor**
The course he/she teaches in the proposed study programme	Shipbuilding technology, Shipyard organization and management, Ship equipment, Industrial practice
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 evaluated)	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

3.4. Optimal number of students

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

3.5. Estimate of costs per student

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

3.6. Plan of procedures of study programme quality assurance

<table>
<tr><td colspan="2">In keeping with the European standards and guidelines for internal quality assurance in higher education institutions (according to “Standards and Guidelines of Quality Assurance in the European Higher Education Area”) on the basis of which the University of Split defines procedures for quality assurance, the proposer of the study programme is obliged to draw up a plan of procedures of study programme quality assurance.</td></tr>
<tr><td colspan="2">Documentation on which the quality assurance system of the constituent part of the University is based:</td></tr>
<tr><td colspan="2">• Regulations on the quality enhancement system of FESB</td></tr>
<tr><td colspan="2">• Quality Assurance Handbook of the constituent part</td></tr>
<tr><td colspan="2">Description of procedures for evaluation of the quality of study programme implementation:
• For each procedure the method needs to be described (most often questionnaires for students or teachers, and self-evaluation questionnaire), name the body conducting evaluation (constituent part, university office), method of processing results and making information available, and timeframe for carrying out evaluation
• If procedure is described in an attached document, name the document and the article.</td></tr>
<tr><td>Evaluation of the work of teachers and part-time teachers</td><td>• Student evaluation of quality of instruction and teaching activities conducted through student survey (printed questionnaires)
• Survey is organised and conducted by the Quality Enhancement Committee of the Faculty (Committee)
• Survey results are processed automatically at the University
• Survey is conducted each semester
• The Committee presents cumulative results of the survey at the sessions of the Faculty Council. The report is published at the Faculty web site.
All procedures are conducted in accordance with the Regulations on organisation and role of the quality assurance system of the University of Split, Regulations on procedure of student evaluation of the quality of teachers and teaching of the University of Split and Regulations on the quality enhancement system of FESB.</td></tr>
<tr><td>Monitoring of grading and harmonization of grading with anticipated learning outcomes</td><td>Committee for study programmes in Mechanical Engineering, Naval Architecture and Industrial Engineering is monitoring the harmonisation of grading and learning outcomes.
All the procedures are conducted in accordance with the Rules of procedure of the Faculty Council and the Rules of procedure of the Department, since the Committees for study programmes are bodies of the Faculty Council and are accountable to the Faculty Council.</td></tr>
</table>

Evaluation of availability of resources (spatial, human, IT) in the process of learning and instruction	• Student evaluation of work performance of administrative and supporting services, learning infrastructure and student life is conducted through e-survey • Evaluation is conducted using an on-line questionnaire which the students complete in each year of study, except the final year • Survey is organised by the Quality Enhancement Centre of the University of Split, and is implemented by the Quality Enhancement Committee of the Faculty (Committee) • Survey results are processed automatically at the University • Survey is conducted every year • Survey results are presented at the Faculty Council sessions and published at the Faculty web site.
Availability and evaluation of student support (mentorship, tutorship, advising)	• Administrative and supporting services are available to students to provide support in their study activities • Supervisors/ mentors are appointed for students' final papers and diploma thesis
Monitoring of student pass/fail rate by course and study programme as a whole	• Analysis of student pass rate by courses and study programmes is carried out once a year • Analysis of pass rate by study programmes is carried out by the University in cooperation with the Committee • Analysis by courses and study programmes is carried out by the Faculty Management Board • Results of both analyses are presented at the Faculty Council sessions and published at the Faculty web site.
Student satisfaction with the programme as a whole	• Student evaluation of work performance of administrative and supporting services, learning infrastructure and student life is conducted through e-survey • Evaluation is conducted using an on-line questionnaire which the students complete following the completion of studies • Survey is organised by the Quality Enhancement Centre of the University of Split, and is implemented by the Quality Enhancement Committee of the Faculty (Committee) • Survey results are processed automatically at the University • Survey results are presented at the Faculty Council sessions and published at the Faculty web site.
Procedures for obtaining feedback from external parties (alums, employers, labour market and other relevant organizations)	• Once every month, the Faculty Management Board meets with the alumni representatives • Once a year, during the annual FESB anniversary event, round tables and workshops are organised with representatives of employers and other stakeholders
Evaluation of student practical education (where this applies)	Student training is not a mandatory part of the programme. Some of the students complete elective-based training abroad
Other evaluation procedures carried out by the proposer	• Internal audit of the quality assurance system is conducted once every year • Self-evaluation is carried out every 5 years All the procedures are conducted in line with the Quality Assurance Handbook of FESB.

Description of procedures for informing external parties on the study programme (students, employers, alums)	• All information are available through the Faculty web site: https://www.fesb.hr • Visits to the faculty are organised for high-school students from Split and the wider region • Participation at University fairs • Public media presentations