Specialist graduate professional study programme in Electrical Engineering

SPLIT, October 2019

GENERAL INFORMATION ON HIGHER EDUCATION INSTITUTION

Name of higher education institution	**University Department of Professional Studies**
Address	Kopilica 5, HR-21000 Split
Phone	+ 385 21 348 900
Fax	+ 385 21 348 900
E.mail	tkovacev@oss.unist.hr
Internet address	https://elektrotehnika.oss.unist.hr/master-program/

GENERAL INFORMATION ON THE STUDY PROGRAMME

Name of the study programme	Specialist graduate professional study programme in Electrical Engineering		
Provider of the study programme	University Department of Professional Studies		
Other participants			
Type of study programme	Professional 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	Professional Master of Electrical Engineering (M.Eng.)		

1. DESCRIPTION OF THE STUDY PROGRAMME

1.1. List of mandatory and elective courses

Meaning: L – lectures; S – seminar; E – exercises; F – field work;

List of courses							
Year of study: 1st							
Semester: 1st							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	MEE001	ENGINEERING MATHEMATICS	30		45		7
	MEE002	STATISTICS AND DESIGN OF EXPERIMENTS	30		30		6
	MEE003	ENGINEERING PHYSICS	30		45		7
	MEE004	PROGRAMMING AND DATA STRUCTURES	30		30		6
		ELECTIVE					4
	Total		120		150		30
Elective	MEE102	PROFESSIONAL COMMUNICATION	15	15	15		4
	MEE103	COMMUNICATION SKILLS AND CULTURAL AWARENESS	15	15	15		4
	MEE112	ELEMENTARY GERMAN	15	15	15		4
	MEE113	ELEMENTARY ITALIAN	15	15	15		4
	MEE114	ELEMENTARY FRENCH	15	15	15		4
	One elective course is chosen						

List of courses							
Year of study: 1st							
Semester: 2nd							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	MEE005	DIGITAL SIGNAL PROCESSING	30		30		6
	MEE006	MICROPROCESSORS AND MICROCONTROLLERS	30		30		6
	MEE007	INDUSTRIAL NETWORKS	30		30		6
		ELECTIVE					6
		ELECTIVE					6
	Total		90		90		30
Elective	MEE104	ELECTRIC MOTOR SYSTEM MANAGEMENT	30	15	15		6
	MEE105	ADVANCED CONTROL OF INDUSTRIAL PROCESSES	30		30		6
	MEE106	OPTOELECTRONICS	30		30		6
	MEE107	ANALOGUE INTEGRATED CIRCUITS	30		30		6
	Two elective courses are chosen						

List of courses							
Year of study: 2nd							
Semester: 3rd							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	MEE008	VIRTUAL INSTRUMENTATION	30		30		6
	MEE009	APPLICATION DEVELOPMENT FOR THE INTERNET OF THINGS	30		30		6
	MEE010	VISUAL MEDIA PROCESSING	30		30		6
		ELECTIVE					6
		ELECTIVE					6
	Total		90		90		30
Elective	MEE108	MODULATION TECHNIQUES	30		30		6
	MEE109	ELECTRIC MACHINES - SELECTED CHAPTERS	30		30		6
	MEE110	WIRELESS COMMUNICATION	30		30		6
	MEE101	ELECTRIC SYSTEMS RELIABILITY	30		30		6
	Two elective courses are chosen						

List of courses							
Year of study: 2nd							
Semester: 4th							
STATUS	CODE	COURSE	HOURS IN SEMESTER				ECTS
			L	S	E	F	
Mandatory	MEE011	PROFESSIONAL PRACTICE				300	10
	MEE012	DIPLOMA THESIS					20
	Total					300	30
ECTS CREDITS IN TOTAL							120

1.2. Course description

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">ENGINEERING MATHEMATICS</td></tr>
<tr><td>Code</td><td>MEE001</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Arijana Burazin Mišura, lecturer</td><td>Credits (ECTS)</td><td colspan="4">7</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Ivo Baras, senior lecturer</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>45</td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">35%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Understanding concepts and knowledge from multivariable calculus and complex functions
• Preparing students for the acquisition of knowledge and skills from professional courses</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Calculus 1/Single Variable Calculus</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Apply a vector calculus and analytical geometry tools for understanding and solving problems with finding lines and planes in the space.
2. Provide basic knowledge in multivariable calculus
3. Apply a differential calculus to determine the local, global and conditional extremes of the multivariable functions.
4. Connect definitions and problems from one variable calculus with
5. those in multivariable calculus
6. Calculate line and plane integrals of scalar and vector field
7. Use elementary functions in a complex domain
8. Define and check analytic functions
9. Apply the technique of residuum
10. Compute Fourier series representation of Periodic Functions
11. 10. Apply a discrete Fourier transformation</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☐ independent assignments
☐ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">STATISTICS AND DESIGN OF EXPERIMENTS</td></tr>
<tr><td>Code</td><td>MEE002</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Renata Kožul Blaževski, senior lecturer</td><td>Credits (ECTS)</td><td colspan="4">6</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Nada Roguljić, lecturer</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">35%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Understand basic concepts regarding Probability Theory, Random Variables, Distributions and Estimation, emphasizing the link between Statistics and Engineering.
• Provide knowledge and skills for the students to apply statistical techniques to engineering problems</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Calculus - undergraduate level</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Manipulate and analyse data using statistical computing software
2. Identify the differences between Probability and Statistics
3. Acquire the basic concepts of Probability, Random Variables (Discrete/Continuous), Probability Distributions and Joint Probability
4. Use graphical and descriptive statistics to summarize and display engineering problem data
5. Employ sample statistics to draw inferences about population through hypothesis testing
6. Apply basic Linear Regression techniques in an engineering context
7. Conduct and interpret results of ANOVA tests
8. Design simple Experiments and analyse results</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☐ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Physics in Engineering</td></tr>
<tr><td>Code</td><td>MEE003</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Jelena Slugan, lecturer</td><td>Credits (ECTS)</td><td colspan="4">7</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>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>45</td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">35%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Understand the deterministic nature of the basic physical laws which it is based on electrostatics and electromagnetism
• Understand the Limits of Determinism and the Usefulness of Random Quantities in Nature Descriptions (quantum physics, deterministic chaos)
• Understand the transmission of information through optical fibres</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">No</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes:</td><td colspan="6">1. Identify introductory concepts from quantum physics
2. Model simple physical situations
3. Use several display types (diagram, graph, table, formula, Euclidean and fractal geometry) and switch from one view to the other
4. Relate Physical Concepts and Techniques to Techniques</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒lectures
☐seminars and workshops
☒exercises
☐on line in entirety
☒partial e-learning
☐field work</td><td colspan="3">☐independent assignments
☒multimedia
☒laboratory
☐work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">PROGRAMMING AND DATA STRUCTURES</td></tr>
<tr><td>Code</td><td>MEE004</td><td>Year of study</td><td colspan="4">1</td></tr>
<tr><td>Course teacher</td><td>Tonći Kozina, lecturer</td><td>Credits (ECTS)</td><td colspan="4">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>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">20%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Acquiring programming skills for working with basic data structures</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Any basic programming course</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Acquire basic principles of programming
2. Design a simple algorithm
3. Implement algorithm in programming language
4. Acquire basic principles of data structures
5. Manipulate collections of data</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☐ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">PROFESSIONAL COMMUNICATION</td></tr>
<tr><td>Code</td><td>MEE102</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Ivana Čizmić, senior lecturer
Jasmina Rogulj, PhD, senior lecturer</td><td>Credits (ECTS)</td><td colspan="4">4</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>E</td><td>F</td></tr>
<tr><td>15</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="4">25%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• This course aims at developing oral and written communication skills and introducing students to useful expressions for their future professional communication.</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. Define basic concepts related to professional communication
2. Improve oral and writing skills
3. Provide a practical approach to business communication at workplace
4. Apply the knowledge acquired and demonstrate it through preparation and delivery of the presentation on a given topic</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒lectures
☒seminars and workshops
☒exercises
☐on line in entirety
☒partial e-learning
☐field work</td><td colspan="3">☒independent assignments
☒multimedia
☐laboratory
☐work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="5">COMMUNICATION SKILLS AND CULTURAL AWARENESS</td></tr>
<tr><td>Code</td><td>MEE103</td><td>Year of study</td><td colspan="3">1.</td></tr>
<tr><td>Course teacher</td><td>Silvana Kosanović, PhD, college professor,
Jasmina Rogulj, PhD, college professor</td><td>Credits (ECTS)</td><td colspan="3">4</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>E</td><td>F</td></tr>
<tr><td>15</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="3">25%</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">• This course aims at introducing students to the basic theoretical and practical knowledge related to intercultural communication competence, understanding of different cultures and interacting across cultures by being involved in general and business communication</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">None</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">1. Define basic concepts related to communication skills and cultural awareness
2. Develop knowledge, skills and competences of communicating across cultures
3. Develop intercultural sensitivity and cultural intelligence
4. Consider cross-cultural differences in communication
5. Apply the knowledge acquired and demonstrate it through preparation and delivery of the presentation on a given topic</td></tr>
<tr><td>Format of instruction</td><td colspan="2">☒lectures
☒seminars and workshops
☒exercises
☐on line in entirety
☒partial e-learning
☐field work</td><td colspan="3">☒independent assignments
☒multimedia
☐laboratory
☐work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">ELEMENTARY GERMAN</td></tr>
<tr><td>Code</td><td>MEE112</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Ivana Čizmić, senior lecturer
Jasmina Rogulj, PhD, college professor</td><td>Credits (ECTS)</td><td colspan="4">4</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>E</td><td>F</td></tr>
<tr><td>15</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="4">25%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• This course aims at preparing students to use German language correctly and appropriately in everyday situations in private life as well as in the workplace, developing all language skills (speaking, listening, reading and writing) and acquiring vocabulary and grammar</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. Define basic concepts used in everyday situations and in the workplace related to the following topics: introducing oneself, daily activities, food and drinks, traffic
2. Describe private and official daily activities, advantages and disadvantages of different means of transport, name favourite food and drinks, compare concepts and grammar rules in German
3. Apply grammar rules related to the following units: Personalpronomen im Nominativ und Dativ, Akkusativ bestimmter/unbestimmter Artikel/0-Artikel. Zahlen. Verb: Konjugation im Präsens. Perfekt mit haben und sein. Modalverben mögen, können, wollen
4. Write simple texts on well-known topics, prepare a calender of private and official activities</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☒ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">ELEMENTARY ITALIAN</td></tr>
<tr><td>Code</td><td>MEE113</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Katarina Krnić, senior lecturer</td><td>Credits (ECTS)</td><td colspan="4">4</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>E</td><td>F</td></tr>
<tr><td>15</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="4">25%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• This course aims at preparing students to use Italian language correctly and appropriately in everyday situations in private life as well as in the workplace, developing all language skills (speaking, listening, reading and writing), acquiring vocabulary and grammar</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. Provide basic information about students themselves and ask for the same information from others using basic Italian grammar and vocabulary knowledge
2. Recognize speech text contents in an everyday situation
3. Apply the acquired basic language knowledge in an everyday environment
4. Place an order in a hotel restaurant, require and provide information on road navigation, express certainty/uncertainty, get information on office/shop opening hours, describing one` flat house, book a hotel room and ask for hotel services, describe an ordinary day in one ‘life
5. Acquire fundamental cultural knowledge on Italy (Italian cities, regions, jobs in Italy, meals and dishes, schedules and working days, Italian tourists in hotel)</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☒ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">ELEMENTARY FRENCH</td></tr>
<tr><td>Code</td><td>MEE114</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Katarina Krnić, senior lecturer</td><td>Credits (ECTS)</td><td colspan="4">4</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>E</td><td>F</td></tr>
<tr><td>15</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="4">25%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• This course aims at preparing students to use French language correctly and appropriately in everyday situations in private life as well as in the workplace, developing all language skills (speaking, listening, reading and writing), acquiring vocabulary and grammar</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. Provide basic information about students themselves and ask for the same information from others using basic French grammar and vocabulary knowledge
2. Recognize speech text contents in an everyday situation
3. Apply the acquired basic language knowledge in an everyday environment
4. Manage to function and communicate in a foreign city/region
5. Deal with the necessary paperwork/documentation upon arrival in a foreign country</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☒ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">DIGITAL SIGNAL PROCESSING</td></tr>
<tr><td>Code</td><td>MEE005</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Tonko Kovačević, PhD., college professor
Barbara Džaja, PhD., senior lecturer</td><td>Credits (ECTS)</td><td colspan="4">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>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">35 %</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Gaining knowledge of digital signal processing
• Acquiring competence to work independently in the practical application of digital signal processing, to solve a variety of real life problems
• By embracing new technologies and applying the acquired knowledge and skills, students are more than able to perform complex technical tasks with digital media.</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. Define the basic concepts essential for understanding the formation of digital signals
2. Describe the use of different methods for signal analysis
3. Acquire the theory and application of various methods for digital signal processing
4. Analyse different assumptions, approaches, procedures and results related to engineering problems in practice
5. Conduct experiments and measurements in the laboratory conditions and on actual components, devices, equipment and systems
6. Construct creative solutions in the analysis, design and development of software, applications and systems</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☒ multimedia
☒ laboratory
☒ work with mentor
☐ (other)</td></tr>
</table>

NAME OF THE COURSE	MICROPROCESSORS AND MICROCONTROLLERS					
Code	MEE006	Year of study	1.			
Course teacher	Marko Vukšić, PhD, College professor	Credits (ECTS)	6			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30		30	
Status of the course	Mandatory	Percentage of application of e-learning	30 %			

COURSE DESCRIPTION		
Course objectives	• Acquiring the fundamentals of microprocessor and microcontroller systems • Gaining skills in programming and developing microprocessor/microcontroller based systems • Understanding primary concept of programming with machine language and C language Becoming familiar with architecture and instruction set of an ATMEL family of microcontrollers • Microprocessors/microcontroller systems Assembly Programming and C programming	
Course enrolment requirements and entry competences required for the course	Knowledge of digital electronics. Knowledge of C programming language.	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. State the internal organization and architecture of some popular microprocessors (6805, 8051)/microcontrollers (ATMEGA16, PIC) 2. The impact of microprocessor based system in process of automation 3. Demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor/microcontroller 4. Conduct experiments for real time data collection by microcontroller based data acquisition system 5. Design interfacing circuits of various devices with the microprocessor and microcontroller 6. Apply knowledge of the microprocessor's internal registers and operations using a PC based microprocessor simulator 7. Apply knowledge of assembly and C programming and other resources to design automated system with microcontroller 8. Select suitable hardware/software platform depending on project requirements 9. Develop confidence for self-education and ability for life-long learning	
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 colspan="2">NAME OF THE COURSE</td><td colspan="5">INDUSTRIAL NETWORKS</td></tr>
<tr><td>Code</td><td>MEE007</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Silvano Jenčić, senior lecturer</td><td>Credits (ECTS)</td><td colspan="4">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>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">30 %</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Understanding basic principles of serial communication and FieldBUS technology
• Designing networks using various standards in industrial environment</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. Describe basic principles of serial communication and FieldBUS technology
2. Illustrate the ways how to implement computer networks in practice
3. Demonstrate interconnection devices and sensors using networks with different standards
4. Calculate communication parameters to establish optimal data transfer rate
5. Recommend network configuration that will meet predefined parameters
6. Explain criteria and parameters of network configuration</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☐ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Electric Motor System Management</td></tr>
<tr><td>Code</td><td>MEE104</td><td>Year of study</td><td colspan="4">1</td></tr>
<tr><td>Course teacher</td><td>Višnja Troskot, lecturer</td><td>Credits (ECTS)</td><td colspan="4">6</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Ivica Lovrić, professional assistant</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</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="4"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Qualifying students to control electromotor drives with alternating and direct currents, motors in static and dynamic states, and their application in various types of electric drives and mechatronics systems in industry, robotics, servo drives and electric vehicles</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Knowledge and skills from the following subjects are required for the course:
• Electric machines: transformers, synchronous machines, induction machines and dc machines.
• Electromotor drives
If a student doesn't have evidence of the listed knowledge, one is obliged to pass the written test regarding the subjects listed above in order to enter the course.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Determine the requirements for a controlled electric motor in an industrial plant.
2. Select the nominal motor and inverter data at static and dynamic operating conditions
3. Select the torque and current speed control system for the default setting
4. Estimate the speed of the electromotor drive and its impact on the engine and power supply
5. Compare the scalar and vector voltage control systems and the frequency of the regulated induction motor
6. Justify the application of engines of increased efficiency and implementation of regulation in consideration with economic criteria and energy savings
7. Analyse various assumptions, approaches, procedures and results related to engineering problems in the management of electric motors
8. Participate in team work and independently present professional content</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">ADVANCED CONTROL OF INDUSTRIAL PROCESSES</td></tr>
<tr><td>Code</td><td>MEE105</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Dean Dereani, senior lecturer</td><td>Credits (ECTS)</td><td colspan="4">6</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Ivica Lovrić, professional assistant</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Elective</td><td>Percentage of application of e-learning</td><td colspan="4"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Control systems design and development, control and data collection based on programmable logical controllers and high-level programming languages
• PID controller tuning, process identification and simulation using engineering software tool</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Basic knowledge in PLC programming.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Use different PLC programming tools according IEC-61131
2. Identify possibilities of applying different programs
3. Propose an appropriate PLC program, i.e. the method of control
4. Process Model Identification
5. Process Model Simulation
6. Propose optimal PID control parameters and program tool</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">OPTOELECTRONICS</td></tr>
<tr><td>Code</td><td>MEE106</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Winton Afrić, PhD., college professor
Predrag Đukić, PhD., college professor</td><td>Credits (ECTS)</td><td colspan="4">6 ECTS</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>E</td><td>F</td></tr>
<tr><td>30</td><td>0</td><td>30</td><td>0</td></tr>
<tr><td>Status of the course</td><td>elective</td><td>Percentage of application of e-learning</td><td colspan="4">30%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Understanding of basic physical optics, nature of light, and laser light
• Quantum physics of laser
• Understanding fiber optic technologies, solutions and systems
• Performing and setting passive optical networks
• Application of fiber optic communication solutions for public operators, special purpose and end users</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. Explain the nature of light, visible and invisible spectrum, properties of light in general
2. Consider basic physical optics, refraction, reflection, filtering of light
3. Familiarise with optical amplification (by stimulated emission), quantum transitions (fluorescence) and optical loss
4. Manipulation and delivery of a laser beam through free space and discrete optical components (apart from fibers) and the basics of modulation of light
5. Explain the basic physical and technical principle of information widening through fiber optic threads
6. Analyse various assumptions, approaches, procedures and results related to engineering problems arising from fiber optic access networks
7. Conduct experiments and measurements in the laboratory and on real components, devices, equipment and systems
8. Interpret the collected data and the measurement results
9. Describe the development and application of optical access and transmission system networks
10. Plan development, PON network and test active equipment for fiber optic networks with regard to technical functionality and participate in team work and independently present professional content</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☐ independent assignments
☒ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">ANALOGUE INTEGRATED CIRCUITS</td></tr>
<tr><td>Code</td><td>MEE107</td><td>Year of study</td><td colspan="4">1.</td></tr>
<tr><td>Course teacher</td><td>Siniša Zorica, senior lecturer</td><td>Credits (ECTS)</td><td colspan="4">6</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Luka Tomasović, senior laborant</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Elective</td><td>Percentage of application of e-learning</td><td colspan="4">30 %</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Get basic knowledge about the structure and analysis of analogue circuits in bipolar and MOS technology
• Theoretical and practical preparation of students for the application of such circuits in electronic devices</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. Design simple amplifiers circuits
2. Analyse the impact of individual elements on the work of amplifiers and types of feedback connections
3. Analyse the operation of the differential amplifier, perform static and dynamic circuit analysis
4. Draw frequency response and Bode plot of amplifier and filter
5. Classify oscillator types according to performance and purpose
6. Calculate the frequency of oscillation and the amplification rate of the amplifier in the oscillator
7. Draw schematic diagrams of power amplifiers in various classes and perform efficiency analysis</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☐ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">VIRTUAL INSTRUMENTATION</td></tr>
<tr><td>Code</td><td>MEE008</td><td>Year of study</td><td colspan="4">2.</td></tr>
<tr><td>Course teacher</td><td>Predrag Đukić, PhD., college professor</td><td>Credits (ECTS)</td><td colspan="4">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>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">30 %</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Getting familiar with basic principles of measuring, the modern virtual electronic instrumentation through hands-on measurements and graphic/textual programming/coding
• Designing a virtual instrument for measuring and storing signals, signal properties and system responses.</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. Describe basic principles measuring, measuring of physical values
2. Use and understand sensors, signal conditioning circuits, and A/D conversion
3. Explain electronic measuring systems properties
4. Design virtual oscilloscope, using diverse software tools (Matlab and LabView)
5. Design user interface
6. Acquire spectrum analysis principles
7. Discuss signal storage (analogue and digital)
8. Consider real time vs. delayed processing</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☐ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">APPLICATION DEVELOPMENT FOR THE INTERNET OF THINGS</td></tr>
<tr><td>Code</td><td>MEE009</td><td>Year of study</td><td colspan="4">2.</td></tr>
<tr><td>Course teacher</td><td>Tonko Kovačević, PhD., college professor</td><td>Credits (ECTS)</td><td colspan="4">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>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">35 %</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Students acquire competence to work independently in the practical application of Internet of Things (IoT)
• Development of Internet of Things products and services.</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. Define the basic concepts essential for understanding the Internet of Things
2. Develop and implement one’s own IoT technologies, solutions, and applications
3. Analyse and compare appropriate sensor network architectures and technologies
4. Choose an engineering approach in designing IoT applications, starting with the acquired theoretical and practical knowledge
5. Design, create and deploy IoT products and services.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☒ multimedia
☒ laboratory
☒ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">VISUAL MEDIA PROCESSING</td></tr>
<tr><td>Code</td><td>MEE010</td><td>Year of study</td><td colspan="4">2.</td></tr>
<tr><td>Course teacher</td><td>Barbara Džaja, PhD., senior lecturer</td><td>Credits (ECTS)</td><td colspan="4">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>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">35 %</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Gaining knowledge of digital media processing
• Students acquire competence to work independently in the practical application of digital media processing, to solve a variety of real life problems, with emphasis on medical visual media
• By embracing new technologies and applying acquired knowledge and skills, students are more than able to perform complex technical tasks with digital media
• Understanding and interpretation of the results
• Implementation and experiments in laboratory and industrial conditions</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">None needed</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Define the basic concepts essential for understanding the formation of images and video formats (understanding)
2. Describe the use of different methods for image and video analysis (knowledge)
3. Consider the theory and application of various methods for digital media processing (application)
4. Analyse different assumptions, approaches, procedures and results related to engineering problems in practice
5. Construct creative solutions in the analysis, design and development of software, applications and systems
6. Conduct experiments and measurements in the laboratory conditions and on actual components, devices, equipment and systems for computer vision
7. Interpret the collected data and measurement results</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☒ multimedia
☐ laboratory
☒ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">MODULATION TECHNIQUES</td></tr>
<tr><td>Code</td><td>MEE108</td><td>Year of study</td><td colspan="4">2.</td></tr>
<tr><td>Course teacher</td><td>Silvano Jencic, senior lecturer</td><td>Credits (ECTS)</td><td colspan="4">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>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Elective</td><td>Percentage of application of e-learning</td><td colspan="4">25 %</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Understanding of modulation techniques
• practical application in selection of modulation techniques in designing and operation of communication equipment</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. Describe principles of modulations
2. Illustrate methods of implementing modulations in communication equipment
3. Demonstrate simulation of communication system using appropriate modulation technique
4. Compare modulation techniques (advantages and disadvantages)
5. Recommend configuration of communication system for the set of parameters
6. Evaluate quality of communication system for the set of parameters</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☐ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
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<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">ELECTRIC MACHINES – SELECTED CHAPTERS</td></tr>
<tr><td>Code</td><td>MEE109</td><td>Year of study</td><td colspan="4">2.</td></tr>
<tr><td>Course teacher</td><td>Višnja Troskot, lecturer</td><td>Credits (ECTS)</td><td colspan="4">6</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Vjekoslav Zrno, professional assistant</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</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="4"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Students acquire knowledge and skills that can determine the characteristics of the installation, selection and maintenance of transformers and electrical machines in power system, power plants, transportation systems and special conditions of use</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Knowledge and skills from the following subjects are required for the course:
• Electric machines: transformers, synchronous machines, induction machines and dc machines.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Explain the terms, physical quantities and laws in the field of electrical machines and devices - transformers, synchronous, induction machines and DC machines
2. Describe the electrical machines operating and control methods (induction machines and DC electrical machines) and the specificity of the application of certain electrical machines and devices
3. Perform measurements on electrical machines, specific experiments and the operation of certain machines
4. Conduct the total metering of all measurements on the default machine, selecting an electric motor
5. Suggest an electric machine that will meet certain requirements
6. Interpret the collected data and measurement results for electrical machines and devices
7. Analyse various assumptions, approaches, procedures and results related to engineering problems in practice and in connection with multimedia communication systems
8. Participate in team work and independently present professional content</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">WIRELESS COMMUNICATIONS</td></tr>
<tr><td>Code</td><td>MEE110</td><td>YEAR OF STUDY</td><td colspan="4">2.</td></tr>
<tr><td>Course teacher</td><td>Ph.D. Winton Afrić, college professor
Toni Jončić, lecturer</td><td>Credits (ECTS)</td><td colspan="4">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>E</td><td>F</td></tr>
<tr><td>30</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="4">30%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Understanding wireless technologies, solutions and systems
• Perform and set up directed wireless communication systems
• Analysis of modern wireless systems (from their system architecture, protocol model, wireless spectrum usage and access methods)
• Design of wireless system solutions with emphasis to IoT</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Recommendation to select „Modulation Techniques“ as an elective course for deeper understanding</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">Understanding of wireless communication system principles with focus on the modern wireless and mobile communication systems.
Student should be able to analyse the environment of WiFi (802.11 standards set), Bluetooth (802.15) and mobile networks (GSM, UMTS, LTE) with focus on physical and access layer.
Plan and design simple wireless networks in terms of coverage and capacity.

1. Describe basic fundamental physical and technical solutions for wireless communication systems of different uses
2. Analyse the different assumptions, approaches, procedures, and results related to engineering problems in the field of wireless communications
3. Develop creative solutions in the design and development of equipment and wireless communication systems
4. Carry out experiments and measurements in the lab and on real wireless components, devices, equipment, and systems
5. Interpret the collected data and the measurement results
6. Describe the development and application of wireless communication systems.
7. Test the communication equipment for technical functionality
8. Participate in teamwork and independently present professional content</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☐ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">ELECTRICAL SYSTEMS RELIABILITY</td></tr>
<tr><td>Code</td><td>MEE101</td><td>Year of study</td><td colspan="4">2.</td></tr>
<tr><td>Course teacher</td><td>Dean Dereani, senior lecturer</td><td>Credits (ECTS)</td><td colspan="4">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>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>Elective</td><td>Percentage of application of e-learning</td><td colspan="4"></td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Understanding the management processes of electrical equipment and systems maintenance
• Theoretical and practical preparation of students to analyze the cause of failure, selection of maintenance strategies and selection of technical diagnostics</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. Identify failure patterns
2. Identify failures modes, failure causes
3. Classify severity analyses for end effects
4. Propose an appropriate maintenance strategy
5. Define the diagnostic method
6. Propose the optimal frequency of preventative activities</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☒ field work</td><td colspan="3">☒ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">PROFESSIONAL PRACTICE</td></tr>
<tr><td>Code</td><td>MEE011</td><td>Year of study</td><td colspan="4">2.</td></tr>
<tr><td>Course teacher</td><td>Mentor</td><td>Credits (ECTS)</td><td colspan="4">10</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td></td><td></td><td></td><td>300</td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">30 %</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Apply acquired theoretical, practical and professional knowledge through work in the real sector
• Participating in the preparation and/or implementation of a professional project
• Ability to write a well-structured and consistent report on the results of the work
• Ability to solve a practical problem under industrial conditions
• Ability for productive work in a team</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">• Certification of worker's ability to work safely on the jobs and tasks to which it is assigned
• Detailed knowledge of all relevant subjects of the programme
• Ability to work in a self-dependent way
• Skills sufficient for a written report and communication in a company</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Apply in practice the knowledge and skills gained during the study
2. Work independently or in a team to solve more complex technical problems
3. Apply the acquired experience in new working environments
4. Make a written report/elaborate</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">The supervisor of professional practice assigns students to relevant companies / institutions according to the Regulations on Professional Practice, student’s interest and the chosen Diploma thesis topic. Students enhance the acquired theoretical knowledge with the new on-the-job skills and knowledge, benefiting from the company’s experts’ experience. Professional practice is realized in professional companies/institutions, engineering offices, production facilities, product testing and quality control departments, construction sites or can be realized at the University Department of Professional Studies. Depending on the chosen company, students should get familiar with:
• organizational structure of the company/institution, office
• managers and their competencies, also to supervise the thesis preparation
• complete working process
• processes of the project preparation, realization and documenting
• production integral course and product manufacture phases
• instrumentation equipment testing and maintenance
• measuring equipment usage
• software development
• quality control and testing
• final products delivery and release
• after sale services.
The student submits a written report on the professional practice activities.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☐ lectures
☐ seminars and workshops
☐ exercises
☐ on line in entirety
☒ partial e-learning
☒ field work</td><td colspan="3">☒ independent assignments
☒ multimedia
☒ laboratory
☒ work with mentor
☐ (other)</td></tr>
</table>

<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">DIPLOMA THESIS</td></tr>
<tr><td>Code</td><td>MEE012</td><td>Year of study</td><td colspan="4">2.</td></tr>
<tr><td>Course teacher</td><td>Mentor</td><td>Credits (ECTS)</td><td colspan="4">20</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>E</td><td>F</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>Status of the course</td><td>Mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">35 %</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">• Ability to carry out professional projects on a specific subject in a self-reliant way
• Ability to write a well-structured and consistent report about the results compliant to the professional standards
• Ability to give an oral presentation of the results</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">• Completion of all the exams at the study programme
• Detailed knowledge of all relevant subjects of the programme
• Ability to work in a self-dependent way
• Skills sufficient for a written thesis and an oral presentation</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">1. Gain professional knowledge contained within the set topic, broadening and deepening the knowledge from the selected field
2. Develop the ability of an independent approach to processing and solving complex professional problems
3. Carry out an independent analysis of the research results and study professional literature
4. Present in writing and give oral presentation of work results</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">• Thesis topic is defined by a special act following the mentor’s suggestion, who is, also to supervise the thesis preparation.
• Guidance towards the thesis topic is based on the student’s interest (certain professional field) shown in the course of study, as well as the type of the completed professional practice. Student, at his own wish and with the mentor’s approval, chooses the thesis topic out of the previously listed topics. The thesis result should be a concrete solution to a complex engineering problem.
• Student does independent research related to the topic. Besides a compulsory written paper and a Power-Point presentation, the thesis also contains measurements, demonstration of circuit operation, device operation, software or a simulation model.
• The thesis comprises introduction where the problem, aims and methods are defined, the paper contents shown and a hypothesis is proposed. This is followed by defining the theoretical basis for the thesis. The next, the most important part, is a description of the practical segment of the task. The final part contains a display of the obtained results, while the conclusion offers a final overview of the topic. The thesis should result from consulting a number of literature bibliographic units. Appendices with various technical data and information can be added.
• Technical part of the task is carried out in accordance with the Ordinance on professional Diploma thesis.</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☐ lectures
☐ seminars and workshops
☐ exercises
☐ on line in entirety
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