MEĐIMURSKO VELEUČILIŠTE U ČAKOVCU
MEĐIMURJE UNIVERSITY OF APPLIED SCIENCES IN ČAKOVEC

COURSE SYLLABUS

ACADEMIC YEAR:	2024/2025	

1. GENERAL COURSE INFORMATION

1.1 Course name	Basics of electrical engineering and electronics			
1.2 Study program/s	UNDERGRADUATE PROFESSIONAL STUDY PROGAMME COMPUTER ENGINEERING			
1.3 Course status (O,E)	O	**1.6 Mode of instruction (number of hours)**	Lectures	30
1.4 Course code			Exercises	45
1.5 Course abbreviation	OEIE		Seminars	
1.6 Semester	I		E-learning	Merlin
1.7 ECTS	7	**1.7 Place and time of instruction**	The premises of the Međimurje University of Applied Sciences in Čakovec, according to the schedule published on the website	

2. TEACHING STAF.F

2.1 Course leader/s-title	Jurica Trstenjak, senior lecturer	**contact**	jtrstenjak@mev.hr
		contact	
2.2 Assistant/s- title		**contact**	
		contact	
2.3 Instruction held by-title	Jurica Trstenjak/ senior lecturer	**contact**	jtrstenjak@mev.hr
2.4 Course leader/s-title		**contact**	

3. COURSE DESCRIPTION

3.1. Course goals	The student should acquire a functional overview of the basic components of modern electronics, learn to use basic methods of analysis and evaluation of parameters of electrical circuits.
3.2 Prerequisites	No
3.3 Course outcomes	After successfully completing the course, students will be able to: O1 - Interpret basic phenomena in electrostatics O2 - Understand and apply Kirchhoff's laws and Ohm's law in the analysis of direct and alternating electric networks O3 - Analyze DC and AC networks using the following methods and theorems: node stress method, star-triangle transformation, superposition, transformation of real source models, Millman's, Thevenin's and Norton's theorem - Analyze the basic phenomena in the magnetic field O5 - Explain the acquisition and operation of semiconductor elements (transistor as a switch)
3.4 Contribution of the course to the study program	Apply the acquired learning skills, basic knowledge of the profession and problem solving necessary for continuing studies at a higher level. Analyze the basic elements of electrical engineering and digital circuits and identify the structure of the computer.
3.5 Course content	Number systems. Codes. Logic circuits. Integrated circuits. Multivibrators. Minimization. Registers. Counters. Sequential circuits. Memories. A/D and D/A conversion.

3.6 Types of coursework	x	Lectures	X	Exercises		Blended e-learning	x	Individual activities		Laboratory
		Seminars and workshops		Distant learning		Field classes		Multimedia and network		Mentorship
		Other								

3.7 Language of instruction	Croatian

3.8 Monitoring students' work (enter the number of ECTS credits for each activity so that the total number of ECTS credits is equal to the total ECTS value of the course, 1 ECTS = 30 hours)	2,5	Class attendance		Seminars		Research
	2,5	Midterm exams/written exam		Project		Essay
	1	Oral exam		Practical task	1	Homework

Activity specification	Percent %	Points
Assessment during instruction		
Lesson assignments	10%	10
Midterm exam 1	30%	30
Midterm exam 2	30%	30
Oral exam	15%	15
Practical tasks	15%	15
Exam assessment for the students who failed to fullfil all the obligatory requirements during the semester		
Written exam	60%	60
Oral exam	15%	15
Total:	**100%**	**100**

Points   Grade
89 – 100 excellent (5)
76 – 88   very good (4)
63 – 75   good (3)
50 – 62   pass (2)
* 0 – 49   fail (1)*

3.9 Specific features related to taking the course	*If a student collects 50% of the points of each outcome he/she directly accesses the oral exam. If a student does not achieve a sufficient number of points on the midterm exam, he/she cannot take the next midterm exam, and has to take the written exam.* *If he/she passes the written exam, he/she will proceed to the oral part of the exam.* *The seminar paper is submitted within the agreed deadline, and certainly before the exam term.* *The final grade is given on the oral part of the exam.*
3.10 Students obligations	• a full-time student has the right to sit for the exam if he attends classes for a minimum of 70% of the total prescribed number of hours • a full-time student who attends classes from 50 to 70% of the total prescribed number of hours can exercise the right to take the exam by completing additional teaching activities in agreement with the course teacher • a full-time student who attends a certain course for less than 50% of the prescribed number of hours enrolls in the course the following academic year

	• a part-time student has the right to sit for the exam if he/she attends classes for a minimum of 30% of the total prescribed number of hours • a part-time student who attends classes for 20 to 30% of the total prescribed number of hours can exercise the right to sit for the exam by completing additional teaching activities in agreement with the course teacher • a part-time student who attends the classes of a certain course for less than 20% of the prescribed number of hours re-enrolls in the course the following academic year
3.11 Written assignments	
3.12 Required reading	
3.13 Additional reading	M. A. Laughton D.F. Warne: Electrical Engineer's Reference Book, 16th Edition, Newnes, 2002.

4. ADDITIONAL INFORMATION ABOUT THE COURSE

4.1 Quality control	The quality of the program, teaching process, teaching skills and level of mastery of the material will be established by conducting a written evaluation based on questionnaires, and in other standardised ways and in accordance with the by-laws of the Međimurje University of Applied Sciences in Čakovec.
4.2 Contact the teacher	Students can contact the teacher during the office hours and during classes. All other methods of communication are arranged with the teacher. It is also possible to ask questions by e-mail, which will be answered in 48 hours at the latest. It is desirable for students to come as often as possible for any possible questions during the teacher's office hours.
4.3 Information about the course	It is the obligation of each student to be regularly informed about the course. All notifications about the classes or possible postponement of classes will be posted on the bulletin board and on the website of the University at least 24 hours in advance.

5. ELABORATION OF THEMATIC UNITS

Week	Topic	Course outcome
1.	Introduction. Physical basics of electrical engineering. Physical sizes	O1
2.	Electrostatics (electricity, Coulomb's law, Electric field, Gauss's law)	O1
3.	Electrostatics (potential, conductor in an electric field, electric dipole, dielectric in an electrostatic field, capacitance)	O1
4.	Electrostatics (forces and energy in the electric field, electrostatic networks)	O1, O2
5.	El. electric circuits (charge movement, electric current, electric resistance, Ohm's law, application of Kirchhoff's laws)	O1, O2
6.	El. Current circuits (direct application of Kirchhoff's laws, method of contour currents)	O2, O3
7.	El. Current circuits (node voltage method, Superposition method).	O2, O3
8.	El. Current circuits (Thevenin's theorem, Norton's theorem), 1st intermediate course	O2, O3
9.	El. Current circuits (Millman's theorem, star-delta, star-delta transformation)	O2, O3
10.	Electromagnetism (magnetic field, law of flow, magnetic flux)	O4
11.	Electromagnetism (Biot-Savart law, induction, self-induction, materials in a magnetic field)	O4
12.	Electromagnetism (magnetic circuits)	O4
13.	Alternating current circuits ,R, C, L, RC, RL and RLC in an alternating current circuit (vector diagrams)	O2
14.	Electronics (diode, transistor, switch)	O5
15.	2nd midterm exam	