VELEUČILIŠTE U KARLOVCU
Karlovac University of Applied Sciences

SYLLABUS PREDMETA

General information

Course title:	Fundamentals of Electrical Engineering I
ISVU[1] course code:	116163
Studies in which the course is taught:	Study of mechanical engineering
Course Instructor:	Filip Žugčić mag.ing.el
Course Assistant:	Dr.sc. Anamarija Kirin
ECTS credits:	5.0
Semester of the course execution:	I
Academic year:	2022./2023.
Exam prerequisites:	-
Lectures are given in a foreign language:	-
Aims:	The objective of the course is to introduce students to the basics of electrostatics, basic methods of calculating the electrical DC networks

Course

Course structure	Number of contact hours per week:	Number of contact hours per semester:	Student's requirements by type of teaching:
Lectures:	2	30	attendence 50%
Tutorials:	2	20	attendance 80%
Practical (lab) sessions:	1	10	attendance 100%
Seminars:			
Field work:			
Other:			
TOTAL:	+	60	

Monitoring of students' work, knowledge evaluation and learning outcomes

	LEARNING OUTCOMES (upon completion of the course the student should be able to:)	**FACTORS AFFECTING THE GRADE** (e.g. term paper, practical work, presentation, ...)	**MAXIMUM NUMBER OF POINTS PER FACTOR**
Formation of the grade during the implementation of teaching: (Define from minimum 5 to maximum 10 learning outcomes)	**I1:** Define the basic of electricity (charge, electric field, energy, potential, voltage, capacity, current, power)		
	I2: Explain the basic laws of electrical engineering (Coulomb's law, Gauss's law, Ohm's law, Kirchoff's laws)		
	I3: Apply the basic laws of electrical engineering to solve the simple tasks of electrostatics and power grids		
	I4: Solve the problems of power grids Thevenin / Norton theorem, contour current methods and node voltages		
	I5: Propose methods for measuring voltage, current and power based on the		

[1] ISVU – Information System of Higher Education Institutions in Croatia

	characteristics of the measuring instruments and the required accuracy		
	I6: Recommend an optimal procedure for solving the complex problems of electrical grids using different methods		
Alternative formation of the grade (I 1 – I 10)	**or alternative formation of the grade: I 1 – I 6** Written exam 70% final grade-I1. I2, I3, I4, I5, I6 Oral exam 30% of final grade		TOTAL: 100 points
Students' competencies	Students will gain general and expert knowledge of electrostatics and different methods for solving DC electrical networks		

Prerequisites for course approval (lecturer's signature):	Attendance at classes and laboratory exercises
Prerequisites for taking exams:	Teacher's signature
Grading scale:	(According to the Regulations on student assessment of Karlovac University of Applied Sciences, Article 9, Paragraph 5) 90-100 - excellent (5) (A) 80 to 89.9 - very good (4) (B) 65 to 79.9 - good (3) (C) 60 to 64.9 - sufficient (2) (D) 50 to 59.9 - sufficient (2) (E) 0 to 49.9 – fail (1) (F) Students are graded during class, what forms 70% of final exam. Students who achieve 50% (35 points) and more are allowed to take the final exam. The score on final exam makes 30% of the final grade.

ECTS structure

ECTS credits allocated to the course reflect the total burden to the student during adoption of the course content. Total contact hours, relative gravity of the content, effort required for exam preparation, as well as, every other possible burden are taken in account:

Attendance (active participation)	**Term paper**	**Composition**	**Presentation**	**Continuous assessment and evaluation**	**Practical work**
0.5					
Independent work	**Project**	**Written exam**	**Oral exam**	**Other**	
		3	**1.5**		

Review of topics/units per week associated with learning outcomes

Week	Lectures topics/units and learning outcomes:	Tutorials topics/units and learning outcomes:
1.	Physical basis of electricity I1	Overview of basic concepts of electricity on specific examples I1
2.	Coulomb's Law I2	Application of Coulomb's Law I3
3.	Electric field I1	Analysis examples of electric field problems I3
4.	Gauss's law I2	Problem Solving Using Gauss Laws I3
5.	Potential and voltage I1	Potential and Voltage Problem Solving I3
6.	Capacitors I1	Solving Capacitor Networks and Capacitor Design Examples I3

7.	Electric current I1	Analysis the problem of current generation and flow through guide I3
8.	Ohm's Law I2	Application of Ohm's law for a simple electric circuit I3
9.	Kirchoff's Laws I2	Application of Kirchoff's Laws to electric networks I3
10.	Electrical Network Analysis I3	Problem solving using the methods to solve simple electrical grids I3
11.	Thevenin's and Norton's Theorem I4	Solving Power Grids Using Thevenin's and Norton's Theorem I4
12.	Contour Current Method I4	Solving electrical grids by contour current method I4
13.	Node Voltage Method I4	Solving electrical networks by node voltage method I4
14.	Basic electrical measurements I5	Carrying out the process of measuring voltage, current and power with measuring instruments I5
15.	Optimal procedure for solving complex electrical grids I6	Resolving complex power grids using a number of different methods I6

References

REFERENCES (compulsory/additional):
B.Kuzmanović: Osnove elektrotehnike I, ISBN:953-197-128-5, Element, 2005 B.Kuzmanović: Zbirka zadataka i pitanja iz Osnove elektrotehnike I, ISBN:953-197-664-3, Element, 2010

Exams for the academic year: 2022./2023.

Exam dates:	According to the schedule of exams for academic year 2022./2023.

Contact information

1. Course Instructor/Lecturer:	
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Office hours / Consultations:	According to the deal
2. Course Instructor/Lecturer:	
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Office hours / Consultations:	According to the deal