VELEUČILIŠTE U KARLOVCU
Karlovac University of Applied Sciences

SYLLABUS PREDMETA

General information

Course title:	SIGNAL PROCESSING
ISVU[1] course code:	38252
Studies in which the course is taught:	Professional Study Programme of Mechatronics
Course Instructor:	Anamarija Kirin
Course Assistant:	-
ECTS credits:	5.0
Semester of the course execution:	IV
Academic year:	2022/2023
Exam prerequisites:	-
Lectures are given in a foreign language:	english
Aims:	After this course students will understand basic signal processing methods and their application in practice and will be able to design systems for signal processing

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	attendance 80%
Tutorials:	2	30	attendance 80%
Practical (lab) sessions:	-	-	
Seminars:	-	-	
Field work:	-	-	
Other:	-	-	
TOTAL:	4	60	

Monitoring of students' work, knowledge evaluation and learning outcomes

Formation of the grade during the implementation of teaching: (Define from minimum 5 to maximum 10 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**
	I 1: Execute operations on signals in time domain		
	I 2: Determine system properties		
	I 3: Apply Laplace and Fourier transform for system response calculation		
	I 4: Explain electric filter transform function		
	I 5: Construct electric filters using transform function approximation		
	I 6: Analyze active and passive filters		
Alternative formation of the grade (I 1 – I 10)	**or alternative formation of the grade: I 1 – I 6** written exam 70% of final grade-I1. I2, I3, I4, I5, I6 oral exam 30% of final grade		TOTAL: 100 points
Students' competencies	Students will have a general understanding of signal processing models and signal processing systems and will be able to design basic filter types.		

Prerequisites for course approval (lecturer's signature):	attendance

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

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Prerequisites for taking exams:	lecturer'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.	Basic signal and system concepts **I1**	Basic concepts applied on specific signal/system **I1**
2.	Basic operations on signals **I1**	Applaying basic operations on common signals **I1**
3.	Basic system properties **I2**	System classification and analysis **I2**
4.	Fourier transform **I3**	Solving Fourier transform problems **I3**
5.	Laplace transform **I3**	Solving Laplace transform problems **I3**
6.	Applications of the Fourier and Laplace transform **I3**	Modulation and frequency response **I3**
7.	Passive network response to a signal **I4**	Analyzing RC and CR network response to a signal **I4**
8.	Normed low pass (LP) filters **I4**	Solving problems with normed low pass (LP) filters **I4**
9.	Transformation of LP prototype to filter **I4**	Transforming specific LP prototypes to filter **I4**
10.	Butterworth approximation **I5**	Designing Butterworth filter **I5**
11.	Chebyshev approximation **I5**	Designing Chebyshev filter **I5**
12.	Bessel approximation **I5**	Designing Bessel filter **I5**
13.	Passive filters **I6**	Solving problems with passive filters **I6**
14.	Active filters with operational amplifiers **I6**	Solving problems with active filters **I6**
15.	D/A i A/D converter **I6**	Converting digital to analog signals **I6**

References

REFERENCES (compulsory/additional):
Ambardar A., Analog and Digital Signal Processing, Brooks/Cole Publishing Company, 2,1998. Tan, J.J.L., Fundamentals of Analog and Digital Signal Processing, AuthorHouse, 2, 2008

Exams for the academic year: 2022/2023

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

Contact information

1. Course Instructor/Lecturer:	Anamarija Kirin
e-mail:	akirin@vuka.hr
Office hours / Consultations:	Wednesday, 11:00, room 110, Ivana Meštrovića 10