



COURSE SYLLABUS

General information

Course title:	Signal Processing
ISVU course code:	38252
Course instructor:	Anamarija Kirin
Course assistant:	-
Study programme and specialization in which the course is taught:	Mechatronics
ECTS credits:	5.0
Semester of the course execution:	IV
Exam prerequisites:	-
Course objectives:	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 structure

Teaching mode	Number of contact hours per semester:	Student's requirements per teaching mode
Lectures:	30	attendance 80%
Exercises (auditory, linguistics):	30	attendance 80%
Exercises (laboratory, practical):		
Field work:		
Other:		
TOTAL:	60	

Monitoring of students' work and knowledge evaluation during the course

OUTCOMES		Partial exam 1	Partial exam 2	Partial exam 3	Oral	Total	Pass	Time frame for the recognition of the outcome
Outcome 1	Determine analog system and signal properties	20				20	10	End of the academic year
Outcome 2	Apply Laplace and Fourier transform for system response calculation		30			30	15	End of the academic year
Outcome 3	Construct electric filters using transform function approximation			30		30	15	End of the academic year
Outcome 4	Explain basic concepts of analog signal processing				20	20	10	End of the academic year
Total % grade points		20	30	30	20	100	50	
Share in ECTS		1,0	1,5	1,5	1,0	5,0		

Knowledge evaluation on exams

Exam prerequisites		Attendance			
OUTCOMES		Written exam	Oral exam	Total	Pass
Outcome 1	Determine analog system and signal properties	20		20	10



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Outcome 2	Apply Laplace and Fourier transform for system response calculation	30		30	15
Outcome 3	Construct electric filters using transform function approximation	30		30	15
Outcome 4	Explain basic concepts of analog signal processing		20	20	10
Total % of grade points		80	20	100	50
Share in ECTS		4,0	1,0		

Review of units per week with associated learning outcomes

Week	Lecture course content and learning outcomes:	Outcome	Exercises course content and learning outcomes:	Outcome
1.	Basic signal and system concepts	01, 04	Basic concepts applied on specific signal/system	01, 04
2.	Basic operations on signals	01, 04	Applying basic operations on common signals	01, 04
3.	Basic system properties	01, 04	System classification and analysis	01,04
4.	Fourier transform	02, 04	Solving Fourier transform problems	02,04
5.	Applications of Fourier transform	02, 04	Applying Fourier transform to electric network	02, 04
6.	Laplace transform	02, 04	Solving Laplace transform problems	02, 04
7.	Applications of Laplace transform	02, 04	Modulation and frequency response	02, 04
8.	RC, CR and RLC network response to a signal	02, 04	Analyzing RC and CR network response to a signal	02, 04
9.	Normed low pass (LP) filters	03, 04	Solving problems with normed low pass (LP) filters	03, 04
10.	Transformation of LP prototype to filter	03, 04	Transforming specific LP prototypes to filter	03, 04
11.	Butterworth approximation	03,04	Designing Butterworth filter	03, 04
12.	Chebyshev approximation	03,04	Designing Chebyshev filter	03, 04
13.	Inverse Chebyshev approximation	03, 04	Designing inverse Chebyshev filter	03, 04
14.	Passive filters	04	Solving problems with passive filters	04
15.	Active filters with operational amplifiers	04	Solving problems with active filters	04

References (compulsory / additional)

1. Ambardar A., Analog and Digital Signal Processing, Brooks/Cole Publishing Company, 2,1998.
2. Tan, J.J.L., Fundamentals of Analog and Digital Signal Processing, AuthorHouse, 2, 2008