Specification for the book of courses

Study program	Control Systems
Module	Automatic Control
Type and level of studies	Master studies
The name of the course	Fourier Analysis and Applications
Lecturer (for lectures)	Rančić Z. Lidija, Matejić M. Marjan
Lecturer/associate (for exercises)	Jovančić S. Vladan
Lecturer/associate (for OFE)	

Number of ECTS	5	**Course status (obligatory/elective)**	Elective

Prerequisites	
Course objectives	Mastering the general principles and techniques of applying Fourier analysis.Training students to apply acquired knowledge to solve engineering problems, especially problems in signal theory, information-communication techniques and applied numerical analysis.
Course outcomes	Developed ability to identify problems in the field of interest and their solving by the methods of Fourier analysis. The ability to apply the acquired knowledge and skills in practice.

Course outline

Theoretical teaching	Fourier series. Analysis of convergence. Fourier integral, Fourier transform, inverse Fourier transform.Characteristics of the Fourier transform. Distributions.Convolution and correlation. Discrete Fourier transform.Fast Fourier transform and Cooley-Tukey algorithm. Cosinous Fourier transform.Multidimensional Fourier transform. Analysis of linear systems.Window functions. Applications in solving practical engineering and scientific problems.
Practical teaching (exercises, OFE, study and research	Solving mathematical models of simpler problems in practice.

Textbooks/references

1	Dušan Milošević, Lidija Rančić, Miodrag Petković, Mathematics IV, Faculty of Electronic Engineering, University of Niš, 2015 (Serbian)
2	Brad Osgood, Lecture Notes for EE 261 The Fourier Transform and its Applications, Electrical Engineering Department Stanford University
3	e-presentation - https://moodle.elfak.ni.ac.rs/
4	
5	

Number of classes of active education per week during semester/trimester/year

Lectures	Exercises	OFE	Study and research work	Other classes
2	2	0		

Teaching methods	Lectures, auditory exercises, consultations

Grade (maximum number of points 100)

Pre-exam duties	Points	Final exam	Points
Activity during lectures	10	**Written exam**	20
Exercises	10	**Oral exam**	20
Colloquia	40		
Projects			