

Study programme(s): Mathematics (M), Integrated Mathematics Studies (M5), Applied Mathematics (MAP)			
Course title: FOURIER ANALYSIS (M138)			
Lecturer(s): Nenad Teofanov			
Course status: elective			
ECTS points: 5			
Requirements: Introduction to Analysis			
Learning Objectives Introduction to theoretical foundations of Fourier analysis and basic properties of trigonometric systems. Adoption of the notion of analysis and synthesis of a signal with applications in digital signal processing. Introduction to the Fourier transform and its inverse.			
Learning Outcomes Students are expected to learn about theoretical basics and practical applications of harmonic analysis. Additionally, students should adopt knowledge and become capable of doing research in possible applications of the exposed tools of mathematical analysis.			
Syllabus <i>Theoretical instructions</i> Hilbert spaces, orthogonal systems and frames. Fourier series and their convergence types. Fourier transform and inverse Fourier transform with their basic properties and applications. <i>Practical instructions</i> Illustration of theoretical results with examples. Seminar papers of theoretical and practical content. Wavelets as examples of orthonormal bases and Gabor systems as examples of frames. Applications to differential equations.			
Literature 1. Nenad Teofanov, Predavanja iz primenjene analize , Zavod za udžbenike, 2011.			
Number of active classes	Lectures: 2		Exercises: 2
Teaching methods Lectures: Exposition of theoretical basics with comments. Exercises: Introduction to applications of the adopted theory through preparation and presentation of seminar papers.			
Grading (maximum number of points 100)			
Pre-exam obligations	Points	Final exam	Points
activities during lectures	10	oral exam	50
seminars	40		