Study programmes: Bachelor studies – Mathematics	
Course name: M4.11 – Approximation Theory	
Lecturers: Zorica Stanimirović	
Status: Optional	
ECTS: 5	
Attendance prerequisites: -	
Course aims: Acquisition of general and specific knowledge in Approximation Theory.	
Course outcome: At the end of the course, a student will be able to choose the most suitable approximation method for a given practical problem, in cases that function to be approximated is given by analytic expression or by discrete set of values. Further, a student will gain knowledge needed to formulate the correct numerical model, to implement adequate numerical method (write computer program), and to find solution with given precision. A student will be able to transform discrete signal to its frequency domain by applying Fast Fourier Transformation (FFT), as well as to find multiresolution decomposition of a signal by using Fast Wavelet Transformation (FWT).	
Course content: Mathematical Preliminaries. Approximation in Hilbert and Banach Spaces. Mean-square Approximation. Orthogonal Polynomials. Least-square method. Fourier Analysis. Discrete Fourier Transformation (DFT). Fast Fourier Transformation (FFT). Wavelets. Fast Wavelet Transformation (FWT). Applications to signal and image processing. Uniform Approximation.	
Literature: Radunović, D., *Talasići,* Akademska misao, 2005. Radunović D., *Numeričke metode*, Akademska misao, 2004. Radunović D., Samardžić A., Marić F., *Numeričke metode - zbirka zadataka kroz C, Matlab i Fortran,* Akademska misao, 2005. Radunović, D., *Wavelets: from math to practice*. Springer Publishing Company, Inc., 2009. Powell, M. J. D., *Approximation theory and methods*. Cambridge University Press, 1981.	

Number of hours: 5	**Lecures: 2**	**Excersises: 3**	**Laboratory: -**	**Research: -**
Teaching and learning methods: Frontal teaching/ Group work/ Practical work				

Assessment (maximal 100 points)			
Course assignments	**points**	**Final exam**	**points**
Lectures	5	Written exam	20
Exercises / Tutorials	5	Oral exam	40
Colloquia	30		