Obuda University John von Neumann Faculty of Informatics			Institute of Applied Mathematics	
Name and code: Fourier analysis and series NMXFA1PMNE **Credits*:* 3** *Applied Mathematics MSc* *2019/20 year II. semester*				
Subject lecturers: Dr. Zoltán Léka				
Prerequisites (with code):	Interpolation and approximation			
Weekly hours:	Lecture: 2	Seminar.: -	Lab. hours: -	Consultation: -
Way of assessment:	Exam			
Course description:				
Goal: Acquiring the basic knowledge and applications related to Fourier analysis				
Course description: Fourier expansion of periodic functions. The space of square-integrable functions. Complete orthonormal basis. Boundary value problems, separation of variables, superposition principle. Haar and Rademacher functions. Wavelets. Fourier transform and inversion theorem.				

Lecture schedule	
Education week	*Topic*
1.	Fourier expansion of periodic functions
2.	Fourier coefficients of odd or even functions. Examples
3.	Fourier series on intervals
4.	The Hilbert space of square-integrable functions
5.	Complete orthonormal basis
6.	Convergence and completeness
7.	1st classroom test
8.	Boundary value problems, separation of variables, superposition principle
9.	Heat equation. and wave equation.
10.	Orthogonal polynomials.
11.	Haar and Rademacher functions, wavelets
12.	Fourier transform and inversion theorem.
13.	2nd classroom test
14.	Summary; rewriting a classroom test; evaluation.

Midterm requirements

Education week	*Topic*
7	1st classroom test: Fourier series and orthonormal systems of functions.
13	2nd classroom test: Boundary value problems, Haar systems.
14	Rewriting a classroom test

2020. 03. 18.

Final grade calculation methods

Achieved result	Grade
89%-100%	excellent (5)
76%-88<%	good (4)
63%-75<%	average (3)
51%-62<%	satisfactory (2)
0%-50<%	failed (1)

Type of exam

Written exam.

Type of replacement

One classroom test can be rewritten on the last week.

References

A. Vretblad, Fourier Analysis and its Applications, Springer, 2003

Recommended:

Stein and Weiss, Introduction to Fourier Analysis on Euclidean Spaces

2020. 03. 18.