

DESCRIPTION OF THE COURSE OF STUDY

Course code	0541.6.MAT2.D.TC	
Name of the course in	Polish	Transformacje całkowe
	English	Integral Transformations

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	mathematics
1.2. Mode of study	full-time studies
1.3. Level of study	Graduate (Master)
1.4. Profile of study*	general academic profile of studies
1.5. Person/s preparing the course description	Dr hab. Grzegorz Łysik
1.6. Contact	glysik@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	Polish and English
2.2. Prerequisites*	Mathematical Analysis II, Differential Equations

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes	lectures / classes	
3.2. Place of classes	classes in the UJK teaching room	
3.3. Form of assessment	Exam / graded credit	
3.4. Teaching methods	Lectures classes	
3.5. Bibliography	Required reading	Walker J. S.: Fourier Analysis, Oxford University Press, 1988
	Further reading	Doetsch G.: Introduction to the Theory and Application of the Laplace Transformation; Springer Science & Business Media, 2012 Widder A.: The Laplace Transform, Princeton University Press, 1946

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

4.1. Course objectives (including form of classes) <i>Lectures</i> C1 – presentation of Fourier series, Fourier and Laplace transformation and their applications <i>Classes</i> C1 – acquirement of abilities of application of Fourier series, Fourier and Laplace transformation to solving ordinary and partial differential equations
4.2. Detailed syllabus (including form of classes) <i>Lectures:</i> Fourier series and their application. Distributions. Convolution of functions and distributions. Fourier transformation of functions and distributions. Inverse Fourier transformation. Application of Fourier transformation in the theory of partial differential equations. Laplace transformation. Inverse Laplace transformation. Application of Laplace transformation to solving algebraically ordinary differential equations. Other integral transformations. <i>Classes:</i> Expansion of periodic functions into Fourier series. Initial value problems for the heat and wave equations. Boundary value problem to the Laplace equation. Computation of Fourier series of functions and distributions. Solving differential equations by the use of Fourier and Laplace transformations.

4.3. Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of KNOWLEDGE:		
W01	Knows a definition and basic properties of the Fourier series and conditions of its convergence	MAT2A_W03
W02	Has a knowledge on distributions, including tempered distributions, operations on distributions, their properties and applications	MAT2A_W03 MAT2A_W19
W03	Knows examples of Fourier and Laplace transforms and their applications in the theory of ordinary and partial differential equations	MAT2A_W03 MAT2A_W19
within the scope of ABILITIES:		
U01	Expands periodic functions into Fourier series	MAT2A_U11
U02	Computes Fourier and Laplace transforms of functions and distributions	MAT2A_U03 MAT2A_U11
U03	Solves differential equations by applying Fourier and Laplace transformations	MAT2A_U03 MAT2A_U11

within the scope of SOCIAL COMPETENCE:		
K01	Formulates questions helpful to deep understanding a subject	MAT2A_K04

4.4. Methods of assessment of the intended learning outcomes							
Teaching outcomes (code)	Method of assessment (+/-)						
	Test*			Effort in class*			
	Form of classes			Form of classes			
	L	C	...	L	C
W01	+						
W02	+						
W03	+				+		
U01					+		
U02					+		
U03					+		
K01					+		

* delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes		
Form of classes	Grade	Criterion of assessment
lectures (L)	3	at least 50% and no more than 60% of the total number of points possible
	3,5	more than 60% and no more than 70% of the total number of points possible
	4	more than 70% and no more than 80% of the total number of points possible
	4,5	more than 80% and no more than 80% of the total number of points possible
	5	more than 90% of the total number of points possible
classes (C)*	3	at least 50% and no more than 60% of the total number of points possible
	3,5	more than 60% and no more than 70% of the total number of points possible
	4	more than 70% and no more than 80% of the total number of points possible
	4,5	more than 80% and no more than 80% of the total number of points possible
	5	more than 90% of the total number of points possible

5. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	Student's workload	
	Full-time studies	Extramural studies
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/	48	
Participation in lectures*	15	
Participation in classes, seminars, laboratories*	30	
Preparation in the exam final test*	3	
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	52	
Preparation for the lecture*	15	
Preparation for the classes, seminars, laboratories*	25	
Preparation for the exam /test*	12	
TOTAL NUMBER OF HOURS	100	
ECTS credits for the course of study	4	

* delete as appropriate

Accepted for execution (date and legible signatures of the teachers running the course in the given academic year)

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