GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Integral equations, PG_00023813		
Field of study	Mathematics		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2023/2024
Education level	second-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	blended-learning
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Differential Equations and Mathematical Applications -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Agnieszka Bartłomiejczyk	
	Teachers	dr Agnieszka Bartłomiejczyk	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	15.0	0.0	15.0	0.0	60

E-learning hours included: 30.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	60	5.0	35.0	100

Subject objectives

The aim of the course is to provide students with knowledge of the integral equations and present analytical manners of solving them.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_K02	Student prepares himself a presentation related to the topic of the lecture	[SK3] Assessment of ability to organize work [SK2] Assessment of progress of work
K7_U03	Student is able to solve differential and integral equations in various ways	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject
K7_W04	Student knows different types of integral equations and their properties	[SW1] Assessment of factual knowledge
K7_U04	Student is able to solve differential and integral equations in various ways	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject
K7_W07	Student knows different types of integral equations and their properties	[SW1] Assessment of factual knowledge

Subject contents	Lectures include the following topics: 1. Preliminaries from functional analysis (spaces, operators) 2. Integral operators 3. Elements of spectral theory 4. Fredholm theory 5. Hilbert-Schmidt theory Various methods for solving integral equations will be additionally discussed in the exercises and project.
Prerequisites and co-requisites	Ordinary and partial differential equations Functional analysis

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
presentation/project	30.0%	20.0%
two colloquia	50.0%	60.0%
test	50.0%	20.0%

Recommended reading

Basic literature	1. W. Kołodziej, *Wybrane rozdziały analizy matematycznej, PWN, Warszawa, 1982* 3. A. Piskorek, *Równania całkowe. Elementy teorii i zastosowania*, WNT, Warszawa, 1997 3. S.B.Leble, Równania całkowe w fizyce i technice, skrypt dla studentów WFTiMS PG, Politechnika Gdańska, 2012, www.mif.pg.gda.pl/homepages/leble/Lectures/RC.pdf 4. J.Chmieliński, Analiza funkcjonalna, Wydawnictwo Naukowe Akademii Pedagogicznej, Kraków, 1999
Supplementary literature	1. M. A. Krasnosielski i in., *Równania całkowe,* Warszawa, WNT, 1975 2. M. L. Krasnov i in., *Zadania z równań całkowych*, Warszawa, PWN, 1972 3. W. I. Smirnov, *Matematyka wyższa*, Warszawa, PWN, 1961
eResources addresses	Adresy na platformie eNauczanie: Równania całkowe 2023/2024 - Moodle ID: 32758 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32758

Example issues/ example questions/ tasks being completed	Association of integral equations with differential equations Classification of integral equations
Work placement	Not applicable