

Subject card

Subject name and code	Practical application of forcing, PG_00178983						
Field of study	Mathematics						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
Education level	Bachelor's studies		Subject group		Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		6.0		
Learning profile	academic		Assessment form		exam		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Rafał Filipów				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	E-learning hours included: 0.0						
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		10.0		80.0	150
Subject objectives	The aim of the course is to familiarize students with the applications of forcing theory.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[MATL3_W09] knows and understands the role and importance of proof in mathematics, as well as the concept of the importance of assumptions	Knows and understands the basic concepts, theorems and methods of forcing and its applications.	[SW4] test/exam - oral or written
	[MATL3_U08] is able to formulate definitions and theorems in an understandable way, both orally and in writing, and present correct mathematical reasoning regarding the acquired issues	Verifies basic properties and proves simple facts about forcing and its applications.	[SU4] test/exam - oral or written
	[MATL3_U09] is able to plan how to solve a specific problem and prepare a correct record of this solution, providing strict and precise justification for the correctness of his reasoning	Verifies basic properties and proves simple facts about forcing and its applications.	[SU4] test/exam - oral or written
	[MATL3_K01] is ready to accept the limitations of his/her own knowledge and understands the need for further education	Knows the limitations of his/her own knowledge and understands the need for further education.	[SK8] observation of student's independent or team work
	[MATL3_K02] is ready to precisely formulate questions to deepen his/ her own understanding of a given topic or to find missing elements of reasoning	Can formulate precise questions that serve to deepen one's understanding of a topic or identify missing elements of reasoning.	[SK8] observation of student's independent or team work
	[MATL3_K04] is ready to understand and appreciate the importance of intellectual honesty in one's own and other people's actions; is willing to act ethically	Understands and appreciates the importance of intellectual honesty in one's own actions and those of others; acts ethically.	[SK8] observation of student's independent or team work
	[MATL3_K06] is ready to formulate opinions on basic mathematical issues	Is able to formulate opinions on basic mathematical issues.	[SK8] observation of student's independent or team work
Subject contents	1. Axioms of ZFC Set Theory 2. Partially Ordered Sets 3. Fundamental Theorems of Forcing Theory 4. Examples of Forcings 5. Applications of Forcing Theory to Infinite Combinatorics		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	observation of the student's attitude	51.0%	0.0%
	egzam	51.0%	50.0%
	tests	51.0%	50.0%
Recommended reading	Basic literature	1. T. Bartoszyński and H. Judah, Set theory. On the structure of the real line 2. A. Blass, Combinatorial Cardinal Characteristics of the Continuum	
	Supplementary literature	1. K. Kunen, Set Theory 2. T. Jech, Set Theory	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. Write a definition of a generic extension 2. Prove the independence of the continuum hypothesis 3. Write a definition of an unbounded number b and a dominant number d 4. Prove the consistency of the inequality b less than d		
Work placement	Not applicable		

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