

Subject card

Subject name and code	Topology II, PG_00206848						
Field of study	Mathematics						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Optional subject group Subject group related to scientific research in the field of study		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		5.0		
Learning profile	academic		Assessment form		exam		
Conducting unit	Institute of Mathematics -> Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Maciej Mroczkowski				
	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		3.0		62.0	125
Subject objectives	Improving the skills related to proving statements. Mastering the material. Preparation for the course Algebraic topology and possible writing of a master's thesis in topology.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[MATMU2_U05] is able to apply new or adapt existing methods and tools from a selected field of mathematics and information and communication technologies in related fields		is able to construct mathematical methods in the field of topology and perform proofs in the exam.		[SU4] test/exam - oral or written		
	[MATMU2_W01] knows and understands in depth the theory of selected areas of mathematics or related fields, the complex relationships between them and their development trends		knows and understands how to extend the scope of topology to include elements of general topology and homotopy theory		[SW2] presentation/project/paper/report		

Subject contents	1. Basic topological concepts (topological space, basis, subbasis, closed sets, maps, homeomorphisms and topological invariants, separation axioms, Urysohn's lemma, Tietze-Urysohn theorem) 2. Operations on spaces (subspace, disjoint sum, Cartesian product, quotient space) 3. Compactness (local compactness, compact extensions, Tikhonov's theorem, paracompactness) 4. Meterizable spaces 5. Connectedness (connected and locally connected spaces, connected components) 6. Homotopy, fundamental group. 7. Covering spaces, theorems on lifting maps.		
Prerequisites and co-requisites	Knowledge of basic concepts and theorems in metric topology.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	51.0%	60.0%
	Presentation of solutions to problems during exercises	51.0%	40.0%
Recommended reading	Basic literature	1. R. Duda Wprowadzenie do topologii, część I , PWN Warszawa, 1986 2. R. Engelking, Topologia ogólna, PWN Warszawa, 1989 3. M.J.Greenberg, Wykłady z topologii algebraicznej, PWN Warszawa 1980 4. E. Dudek, Zbiór zadań do wykładu fakultatywnego "Topologia II", praca mgr UG, skrypt kserograficzny.	
	Supplementary literature	not applicable	
	eResources addresses		
Example issues/ example questions/ tasks being completed	not applicable		
Work placement	Not applicable		

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