University of Gdańsk

Subject card

Subject name and code	Topological Data Analysis, PG_00170080						
Field of study	Mathematics						
Date of commencement of studies	October 2024		Academic year of realisation of subject	2024/2025			
Education level	Master's studies		Subject group	Optional subject group			
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	credit			
Conducting unit	Institute of Mathematics -> Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Michał Stukow					
	Teachers	dr hab. Michał Stukow					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	0.0	30.0	30
	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	30		5.0	90.0	125	
Subject objectives	The aim is to prepare students to write a master's thesis.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[MATMU2_K04] is ready to understand and appreciate the importance of intellectual honesty in one's own and other people's actions; ethical conduct	N/A	[SK8] observation of student's independent or team work
[MATMU2_U04] is able, at an advanced level and including modern mathematics, to apply and present, orally and in writing, methods of at least one selected branch of mathematics	N/A	[SU2] presentation/project/paper/ report
[MATMU2_K06] is ready to formulate opinions on basic mathematical issues	N/A	[SK1] oral statement/conversation/ discussion
[MATMU2_K05] is ready to independently search for information in literature, also in foreign languages	N/A	[SK2] presentation/project/paper/ report
[MATMU2_K01] is willing to acknowledge the limitations of his or her own knowledge and is willing to pursue further education	N/A	[SK8] observation of student's independent or team work
[MATMU2_K02] is ready to precisely formulate questions to deepen his/her understanding of a given topic or find missing elements of reasoning	N/A	[SK1] oral statement/conversation/ discussion
[MATMU2_W03] knows and understands in-depth a selected field of theoretical or applied mathematics and is able to understand the formulations of issues in this field that are still at the research stage and knows the connections of issues in this field with other areas of mathematics	N/A	[SW2] presentation/project/paper/ report
[MATMU2_U05] can perform proofs in a selected field and, if necessary, also use tools from other areas of mathematics	N/A	[SU2] presentation/project/paper/ report
[MATMU2_U03] can understand mathematical texts of various types from selected fields of mathematics	N/A	[SU2] presentation/project/paper/ report
[MATMU2_W07] knows and understands the basic legal and ethical conditions related to scientific and teaching activities	N/A	[SW1] oral statement/ conversation/discussion
[MATMU2_U08] is able to prepare in-depth written works in Polish and at least one foreign language in a selected field of mathematics	N/A	[SU2] presentation/project/paper/ report
[MATMU2_U07] is able to define his/her interests and develop them; in particular, is able to establish contact with specialists in his/her field, e.g. understand their lectures intended for young mathematicians	N/A	[SU1] oral statement/conversation/ discussion
[MATMU2_U02] can express mathematical content in speech and writing, in mathematical texts of various nature	N/A	[SU2] presentation/project/paper/ report
[MATMU2_U09] can prepare oral presentations in-depth in Polish and at least one foreign language, in a selected field of mathematics	N/A	[SU2] presentation/project/paper/ report

Subject contents

N/A

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	50.0%	100.0%
	100.0%	0.0%

Recommended reading

Basic literature	T. K. Dey and Y. Wang, *Computational Topology for Data Analysis*

	Supplementary literature	• Raul Rabadan and Andrew J. Blumberg, *Topological Data Analysis for Genomics and Evolution* • G. Carlsson, M. Vejdemo-Johansson, *Topological Data Analysis with Applications* • J. Tierny, *Topological Data Analysis for Scientific Visualization* • A. J. Zomorodian, *Topology for Computing*
	eResources addresses	
Example issues/ example questions/ tasks being completed	N/A.	
Work placement	Not applicable	

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