

Subject card

Subject name and code	Cardinals and ordinals, PG_00208681						
Field of study	Mathematics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2026/2027		
Education level	Bachelor's studies		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		2.0		
Learning profile	academic		Assessment form		credit		
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	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		15.0	50
Subject objectives	The aim is to prepare students to report on selected topics and write a term paper.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[MATL3_U16] can speak about mathematical problems in understandable colloquial language	can talk about mathematical issues in understandable language	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report
	[MATL3_U15] has the ability to prepare oral presentations in Polish and at least one foreign language about selected mathematical issues using various sources of knowledge	is able to prepare oral presentations on selected mathematical issues using various sources of knowledge	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report
	[MATL3_K10] is ready to analyze data and communicate the conclusions of such analysis in an accessible form	is ready to analyze data and communicate the conclusions from such analysis in an accessible form	[SK1] oral statement/conversation/discussion
	[MATL3_K01] is ready to accept the limitations of his/her own knowledge and understands the need for further education	is willing to acknowledge the limitations of his own knowledge	[SK1] oral statement/conversation/discussion [SK3] text preparation/written 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	is ready to understand and appreciate the importance of intellectual honesty in one's own and other people's actions; ethical conduct	[SK8] observation of student's independent or team work
	[MATL3_K05] is ready to independently search for information in literature, also in foreign languages	is ready to independently search for information in literature, including in foreign languages	[SK2] presentation/project/paper/report [SK3] text preparation/written work
	[MATL3_K06] is ready to formulate opinions on basic mathematical issues	is ready to formulate opinions on basic mathematical issues	[SK1] oral statement/conversation/discussion [SK3] text preparation/written work
	[MATL3_W14] knows and understands the basic concepts and principles of industrial property protection and copyright, is able to use patent information resources	knows and understands the basic concepts and principles of copyright law	[SW3] text preparation/written work
	[MATL3_W13] knows and understands the legal and ethical conditions related to scientific and teaching activities	knows and understands the ethical conditions related to scientific	[SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report [SW3] text preparation/written 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	is ready to formulate precise questions that serve to deepen one's own understanding of a given topic or to find missing elements of reasoning	[SK1] oral statement/conversation/discussion [SK3] text preparation/written work
	[MATL3_K09] is ready to critically evaluate arguments, find gaps in reasoning and constructively criticize other people's reasoning	is ready to critically evaluate arguments, find gaps in reasoning and constructively criticize the reasoning of others	[SK8] observation of student's independent or team work
Subject contents	1. Finite, countable and uncountable sets 2. Ordinal numbers 3. Cardinal numbers 4. Alephs 5. Axiom of choice 6. Arithmetic of cardinal numbers 7. Filters and ultrafilters 8. Combinatorial set theory 9. Large cardinal numbers		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Report/term paper	51.0%	100.0%
	Activity in the discussion	100.0%	0.0%
	Observation of the student's attitude during classes	100.0%	0.0%
Recommended reading	Basic literature	1. K. Hrbacek, T. Jech, Introduction to Set Theory 2. K. Ciesielski, Set Theory for the Working Mathematician	
	Supplementary literature	1. K. Ciesielski, Set Theory for the Working Mathematician 2. W. Just, M. Weese, Discovering Modern Set Theory	
	eResources addresses		

Example issues/ example questions/ tasks being completed	Not applicable
Work placement	Not applicable

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