

DESCRIPTION OF THE COURSE OF STUDY

Course code	0541.6.MAT2.D.TG	
Name of the course in	Polish	Teoria grafów
	English	Graph Theory

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	mathematics
1.2. Mode of study	full-time studies
1.3. Level of study	Graduate (Master)
1.4. Profile of study*	general academic profile of studies
1.5. Person/s preparing the course description	dr Joanna Garbulińska-Węgrzyn
1.6. Contact	jgarbulinska@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	Polish and English
2.2. Prerequisites*	none

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes	Lectures and classes
3.2. Place of classes	classes in the UJK teaching room
3.3. Form of assessment	Exam (lectures), graded credit (classes)
3.4. Teaching methods	Lectures – information lecture Classes - discussions, solving problems
3.5. Bibliography	Required reading
	Further reading
	Diestel R., Graph Theory, wyd. 3, Springer, 2006 (available on http://diestel-graph-theory.com/ [dostęp 8.12.2013]). Chartrand G., Lesniak L., Zhang P., Graphs & Digraphs, CRC Press Taylor & Francis Group, 2011. Godsil Ch., Royle G.F., Algebraic Graph Theory, Springer, 2004.

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

4.1. Course objectives (including form of classes)
Lectures
C1 - an introduction to graph theory. C2 - an introduction to some of the more advanced problems of graph theory.
Classes
C1 - acquiring the ability to use theoretical-graph tools. C2 - developing the habit of learning, improving your own workshop and formulating questions to deepen your own understanding of a given topic.
4.2. Detailed syllabus (including form of classes)
Lectures
Definitions of simple and directed graphs; multiple edges and loops; infinite graphs. Neighborhood matrix, incident matrix. The most important classes of graphs: planar, bipartite, triangular. Graph connectivity. Coloring graph vertices and edges: perfect graphs. Matching. Hypergraphs. Searching graphs. Shortest path search algorithms.
Classes
Basic concepts of graph theory, basic examples of graphs. Chromatic number, click number, Euler cycle and Hamilton cycle. Trees and their properties. Neighborhood matrix, incident matrix. Searching graphs in depth and in width. Shortest path search algorithms (eg. Dijkstra, Bellman - Ford, Floyd - Warshall).

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of KNOWLEDGE:		
W01	cites definitions and interprets the concept of a simple graph and a directed graph, lists the basic examples of graphs	MAT2A_W02
W02	provides definitions and interprets the basic properties of a graph (e.g. consistency, planarity, perfection)	MAT2A_W01 MAT2A_W02
W03	provides definitions and interprets the concept of a hypergraph	MAT2A_W02

within the scope of ABILITIES:		
U01	determines the chromatic and click number of the graph (in simple cases)	MAT2A_U01
U02	investigates the existence of the Euler cycle and the Hamilton cycle in a graph	MAT2A_U01 MAT2A_U12
within the scope of SOCIAL COMPETENCE:		
K01	understands the need for systematic learning	MAT2A_K01

4.4. Methods of assessment of the intended learning outcomes																					
Teaching outcomes (code)	Method of assessment (+/-)																				
	Exam oral/written*			Test*			Project*			Effort in class*			Self-study*			Group work*			Others* e.g. standardized test used in e-learning		
	Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes		
	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...
W01	+																				
W02	+																				
W03	+																				
U01																					
U02																					
K01																					

*delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes		
Form of classes	Grade	Criterion of assessment
lecture (L) (including e-learning)	3	at least 50% and no more than 60% of the total number of points possible
	3,5	more than 60% and no more than 70% of the total number of points possible
	4	more than 70% and no more than 80% of the total number of points possible
	4,5	more than 80% and no more than 90% of the total number of points possible
	5	more than 90% of the total number of points possible
classes (C)* (including e-learning)	3	at least 50% and no more than 60% of the total number of points possible
	3,5	more than 60% and no more than 70% of the total number of points possible
	4	more than 70% and no more than 80% of the total number of points possible
	4,5	more than 80% and no more than 90% of the total number of points possible
	5	more than 90% of the total number of points possible

5. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	Student's workload	
	Full-time studies	Extramural studies
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/	48	
Participation in lectures*	15	
Participation in classes, seminars, laboratories*	30	
Preparation in the exam/ final test*	3	
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	52	
Preparation for the lecture*	10	
Preparation for the classes, seminars, laboratories*	20	
Preparation for the exam/test*	22	
TOTAL NUMBER OF HOURS	100	
ECTS credits for the course of study	4	

*delete as appropriate

Accepted for execution (date and legible signatures of the teachers running the course in the given academic year)

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