Course title:	**Graph theory**
Institute/Division:	Institute of Mathematics, Faculty of Physics, Mathematics and Computer Science
Course code:	F2-GT
Erasmus subject code:	11.1 Mathematics
Number of contact hours:	45 hours
Course duration:	1 semester
ECTS credits:	6
Course description:	This is an elementary graph theory course for students majoring in Mathematics, Computer Science, Physics or Engineering. Can be offered as an elective to both foreign and native Polish students. The emphasis is on showing how various problems originating in science, engineering and in real life are (often unexpectedly) amenable to graph theory methods. We cover: basic notions and theorems of the theory; routing problems (Euler and Hamiltonian circuits, Chinese Postman problem, Minimum Network Problem, TSP), optimization problems (like scheduling problems), planarity, graph coloring, matching in bipartite graphs and flows in networks. Well known algorithms, such as Dijkstra's, Floyd-Warshall's, Fleury's, Kruskal's, Prim's, Ford-Fulkerson's and some approximate algorithms for TSP are studied and practiced. The algorithm complexity is defined and calculated for some of the above algorithms. The NP-completeness of HAM-CYCLE and TSP is explained at the level adapted to the level of the course participants.
Literature:	E. Goodaire, M. Parmenter, *Discrete Mathematics with Graph Theory*, Prentice Hall, many editions R. Wilson, *Introduction to Graph Theory*
Course type:	interactive lectures with problem solving
Assessment method:	attendance, participation, homework, two quizzes, midterm and final exam
Prerequisites:	Linear Algebra
Primary target group:	Computer Science, Engineering Sciences, Mathematics and Physics majors; preferably sophomore or junior; students of other levels are also welcome
Lecturer:	Katarzyna Pałasińska, PhD
Contact person:	Katarzyna Pałasińska, e-mail: kpalasinska@gmail.com
Deadline for application:	15th September