

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject (-)Network Theory		Code 1010803121010824612
Field of study Communications Technologies	Profile of study (general academic, practical) general academic	Year /Semester 1 / 2
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) elective
Cycle of study: Doctoral studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 15 Classes: - Laboratory: - Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: dr inż. Piotr Zwierzykowski email: piotr.zwierzykowski@put.poznan.pl tel. 061 665 3903 Faculty of Electronics and Telecommunications ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Advanced-level knowledge of general nature in the scope defined by the PhD thesis being written, as well as indepth knowledge of related subjects (SD-W01).
2	Skills	Ability to efficiently obtain information connected with scientific activity from various sources, and proper selection and interpretation of such information (SD-U01).
3	Social competencies	Ability to work in a team, openness to collaboration with others (UD-K02). Ability to plainly and comprehensibly popularise knowledge on the achievements of science and technology (UD-K03).
Assumptions and objectives of the course: The aim of the course is to familiarize students with current research problems in the field of network theory, develop skills of critical analysis of scientific articles, and information retrieval research.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Acquaintance with important unsolved problems in the domain under study. - [SD-W03]		
Skills:		
1. Ability to independently formulate and verify research hypotheses. - [SD-U02]		
2. Ability to plan, prepare and conduct scientific research and experiments. - [SD-U03]		
Social competencies:		
1. Self-criticism in creative work, recognition and appreciation of the need for continuous improvement of professional competences - [SD-K01]		
Assessment methods of study outcomes		
Test exam base on the Moodle E-learning platform.		
Course description		

<p>1) Placing on the issues of network theory: basic terminology and types of networks: social networks, biological networks, network technology, information networks - knowledge networks.</p> <p>2) Network properties: the effect of "small world", divides the network into clusters, the degree distributions networks, network resilience to damage.</p> <p>3) Mathematics in modeling networks: random graphs, exponential random graphs, Markov graphs and "small world" model.</p> <p>4) Network's development models: Price's model, Barabasi-Albert's model and other models of network development.</p> <p>5) The processes taking place in the networks: the network resistance and epidemiological processes.</p>		
<p>Basic bibliography:</p> <p>1. R. K. Ahuja i inni: ? Network Flows: Theory, Algorithms, and Applications?, Prentice Hall, 1993</p> <p>2. T.H. Cormen i inni: ?Introducion to Algorithms?,The MIT Press, 2009</p>		
<p>Additional bibliography:</p> <p>1. R. J. Wilson: ?Intoduction tho Graph Theory?, Pearson; 5 edition, 2012</p>		
<p>Result of average student's workload</p>		
<p>Activity</p>		<p>Time (working hours)</p>
1. Lecture		15
2. Individual consultation		15
3. Self study		15
4. Preparation to the exam		10
<p>Student's workload</p>		
<p>Source of workload</p>	<p>hours</p>	<p>ECTS</p>
Total workload	55	2
Contact hours	25	1
Practical activities	30	1