

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Optical Communications		Code 1010804161010830039
Field of study Electronics and Telecommunications	Profile of study (general academic, practical) general academic	Year /Semester 3 / 6
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: - Classes: - Laboratory: 15 Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) major		(university-wide, from another field) from field
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 Stępczak email: piotr.stepczak@et.put.poznan.pl tel. +48 61 6653883 Faculty of Electronics and Telecommunications ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	K_W01 K_W02 K_W05 K_W08
2	Skills	K_U01 K_U07 K_U09
3	Social competencies	K_K01
Assumptions and objectives of the course: Lerning of basic principles and techniques underlying the transmission of optical communication and optical signals in optical fiber communication systems.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Has a systematic knowledge, together with necessary mathematical background, of light propagation and methods of its description in the fiber. - [K1_W07] 2. Has a wide, systematic knowledge of the properties and characteristics of active and passive components of fiber optic system teletransmission, as well as their classification, selection, analysis and design of opto-electronic circuits. - [K1_W08] 3. Has a systematic knowledge, together with theoretical background, of optoelectronics and opto-telecommunication. - [K1_W21]		
Skills: 1. Is able to extract information from Polish or English language literature, databases and other sources. Is able to synthesize gathered information, draw conclusions, and justify opinions. - [K1_U01] 2. Is able to evaluate the parameters describing digital signals transmission quality in optical communication channels and fiber optic systems. - [K1_U19] 3. Is able to formulate specifications, design and conduct measurements of optoelectronic components parameters. Is able to conduct link analysis, formulate requirements and design an optical fibre link. - [K1_U20]		
Social competencies:		

1. Demonstrates responsibility and professionalism in solving technical problems. Is able to participate in collaborative projects. - [K1_K02]
 2. Is aware of the impact electronics and ICT systems and optical networks will have on the development of the information society. - [K1_K04]

Assessment methods of study outcomes		
- Reports from laboratory exercises.		
Course description		
Principles of light propagation. Step index, graded index, and single-mode optical fibers, numerical aperture and acceptance angle. Modes in optical waveguides. Mode and chromatic dispersion. Transmission characteristics. Non-linear effects. Methods of measuring attenuation and dispersion. Optical fibre cables, installation principles. Connecting fibres, joints and connectors. Optical sources, light-emitting and laser diodes, principles of operation, parameters. Photodiodes and optical receivers. Basic elements of an optical transmission system. Design principles. The idea of WDM, WDM couplers, optical filters, OTDM. Fibre optic networks.		
Basic bibliography:		
1. J. Senior, Optical Fiber Communications. Principles and Practice, Prentice Hall, 1992. 2. J.C. Palais, Fiber optic communications, Prentice-Hall, 1998. 3. J. Siuzdak, Wstęp do współczesnej telekomunikacji światłowodowej, WKiŁ, 1997. 4. K. Perlicki, Pomiar w optycznych systemach telekomunikacyjnych, WKiŁ, 2002.		
Additional bibliography:		
1. J. Siuzdak, Systemy i sieci fotoniczne, WKŁ, 2009. 2. K. Perlicki, System transmisji optycznej WDM, WKŁ, 2009. 3. K. Booth, S. Hill, Optoelektronika, WKŁ, 2001.		
Result of average student's workload		
Activity	Time (working hours)	
1. Laboratory exercises.	30	
2. Preparation for labs	10	
3. Consultation	2	
4. Tests	3	
Student's workload		
Source of workload	hours	ECTS
Total workload	53	2
Contact hours	23	1
Practical activities	30	2