GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fiberoptic Data Transmission Networks, PG_00048692		
Field of study	Electronics and Telecommunications, Biomedical Engineering, Biomedical Engineering, Biomedical Engineering		
Date of commencement of studies	February 2027	Academic year of realisation of subject	2027/2028
Education level	second-cycle studies	Subject group	Optional subject group Specialty subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Metrology and Electronic Systems Department -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Małgorzata Szczerska	
	Teachers	prof. dr hab. inż. Małgorzata Szczerska	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	30.0	0.0	60

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	60	5.0	60.0	125

Subject objectives

Students are taught to:
1 analyze the dispersion and delay of signals in fiber-optic system.

2 analyze the power balance in the fiber-optic system.

3 a noise analysis in a fiber-optic system.

4 design fiber optic transmission links based on the received requirements.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U12] is able, to an increased extent, to analyze the operation of components and systems related to the field of study, as well as to measure their parameters and study their technical characteristics, and to plan and carry out experiments related to the field of study, including computer simulations, interpret the obtained results and draw conclusions	The student has the ability to assess the performance of a fiber optic data transmission system.	[SU1] Assessment of task fulfilment
	[K7_W02] knows and understands, to an increased extent, selected laws of physics and physical phenomena, as well as methods and theories explaining the complex relationships between them, constituting advanced general knowledge in the field of technical sciences related to the field of study	The student knows and understands the impact of noise, dispersion and non-linear phenomena on the transmission of optical signals in the optical fiber path.	[SW1] Assessment of factual knowledge
	[K7_W03] knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	Student knows fiber optic networks and their structures, structure and parameters of fiber optic path elements.	[SW1] Assessment of factual knowledge
	[K7_U03] can design, according to required specifications, and make a complex device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	He can design a fiber optic network.	[SU1] Assessment of task fulfilment

Subject contents	Course content – lecture 1. Introduction. 2. Fiber optic communication system. 3. Lightwave fundamentals. 4. Integreted Optic Waveguides. 5. Optic fiber waveguide. 6. Optical sources and amplifiers. 7. Light detectors. 8. Couplers and connectors. 9. Distribution network. 10. WDM and DWDM system. 11. OTDM system. 12. OCDM system. 13. Noise and detection. 14. Desing of analog system. 15. Design of digital system. 16. Measurements in optical systems.
Prerequisites and co-requisites	
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
project	60.0%	50.0%
exam	60.0%	50.0%

Recommended reading	Basic literature	1. J.C. Palais, "Fiber optic communications", Prentice Hall, New York, 2005 K. Perlicki, 2. J.E. Midwinter, Y.L. Guo, "Optoelectronic and Lightwave Technology", John Wiley & Sons 1992 3. B.E.A. Saleh, M.C. Teich, "Fundamentals of Photonics", 2nd Edition, John Wiley & Sons, New York, 2007 4. W. van Etten, J. van der Plaats, "Fundamentals of Optical Fiber Communications", Prentice Hall 1991 5. J. Wilson, J.F.B. Hawkes, "Optoelectronics. An Introduction", Prentice Hall International 1983
	Supplementary literature	----------
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Design a system that will satisfy the requirements.	
Practical activites within the subject	Not applicable	

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