FACULTY OF ELECTRICAL ENGINEERING

SUBJECT CARD

Name in Polish:	**Technika światłowodowa**
Name in English:	**Fiber Optics**
Main field of study (if applicable):	**Industrial Control Engineering**
Specialization (if applicable):	**Automation and Control in Electrical Power Systems**
Level and form of studies:	**2nd level, full-time**
Kind of subject:	**obligatory**
Subject code:	**APR012214**
Group of courses:	**NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	30				
Number of hours of total student workload (CNPS):	30				
Form of crediting:	crediting with grade				
For group of courses mark (X) final course:					
Number of ECTS points:	1				
including number of ECTS points for practical (P) classes :					
including number of ECTS points for direct teacher-student contact (BK) classes:	0.70				

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Has basic knowledge of optics needed to understand optoelectronic phenomenon and fiber guide communication
2. Has basic knowledge of optoelectronics

SUBJECT OBJECTIVES

C1. Acquaintance with rules for exploitation of light guiding elements and their exploitation standards
C2. Acquaintance with functions and methods of realization optoelectronic units for light guiding purposes
C3. Explanation notions related to optical wave guides, reasons of disturbances appearance and methods of prevention
C4. To gain practical skills needed for connecting optoelectronic elements, conducting investigations and researching circuits

SUBJECT LEARNING OUTCOMES

relating to knowledge:

PEU_W01 Understands and is able to describe methods of various optical network configurations
PEU_W02 Has knowledge about optical phenomenon and optical elements dedicated for optical transmission

relating to skills:

relating to social competences:

PEU_K01 Is conscious about responsibility for his own work and is willing to acknowledge teamwork rules

PROGRAMME CONTENT		
Form of classes - lecture		**Number of hours:**
Lec 1	Aquitaince with the subject, its program and the requirements of completion	2
Lec 2	Principles of wave theory of light propagation	2
Lec 3	Dielectric light guides, properties, basic parameters, fabrication	2
Lec 4	Problems of effective propagation of the light wave in fiber guides	2
Lec 5	Mechanisms of power losses in fiber guides: dispersion, refraction	2
Lec 6	Photoemission components and systems used in fiber optic technology	2
Lec 7	Photodetection components and systems used in fiber optic technology	2
Lec 8	Auxiliary, passive elements in fiber-optics networks and systems	2
Lec 9	Splices and optical connectors	2
Lec 10	Expanding optical system capacity by multiplexing	2
Lec 11	Digital and analog modulation of optical signals	2
Lec 12	Properties, classifications and operational parameters of the fiber guides	2
Lec 13	Practical realization and ways to configure transmission systems	2
Lec 14	Optical phenomena employed in fiber sensors	2
Lec 15	Summarizing and assesment	2
	Total hours:	**30**

TEACHING TOOLS USED
N1. Lecture with use of multimedia techniques
N2. Assessment in form of oral or writing test

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT		
Evaluation *F – forming (during semester)* *P – concluding (at semester end)*	**Educational effect number**	**Way of evaluating educational effect achievement**
F1(W)	PEU_W01 PEU_W02 PEU_K01	Evaluation test, oral or writing form
P(W)	P=F1	

PRIMARY AND SECONDARY LITERATURE
PRIMARY LITERATURE:
Palais J. C.; Zarys telekomunikacji światłowodowej, WKŁ, Warszawa, 1991. Midwinter J. E., Guo Y. L.; Optoelektronika i technika światłowodowa, WKŁ, Warszawa,1995. Chai Yeh, Hanbook of Fiber Optics – Theory and Applications, Academic Press. Inc, London, 1990. Hornet J.L., Optical Signal Processing, Academic Press, Inc. London, 1990
SECONDARY LITERATURE:
Smoliński A.; Optoelektronika światłowodowa, WKŁ, Warszawa, 1985. Gagliardi R.M., Karp S., Optical Communications, Willey-int.Pub. CIGRE Working Group 35.04, optical Cable Selection fo Electricity Utilities, Febr. 2001 Handbook of Optics Volume I-V, Mc Graw Hill Companies Inc.,Third Edition USA 2010

SUBJECT SUPERVISOR
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