

FACULTY OF ELECTRICAL
ENGINEERING**SUBJECT CARD**

Name in Polish: **Optoelektronika w układach automatyki**
 Name in English: **Optoelectronics in control systems**
 Main field of study (if applicable): **Electrical Engineering**
 Specialization (if applicable):
 Level and form of studies: **1st level, full-time**
 Kind of subject: **optional**
 Subject code: **ELR052201**
 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):	90				
Form of crediting:	crediting with grade				
For group of courses mark (X) final course:					
Number of ECTS points:	3				
including number of ECTS points for practical (P) classes :					
including number of ECTS points for direct teacher-student contact (BK) classes:	2.10				

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Has a basic knowledge of physics concerning the optics

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. Acquaintance with functions and methods of realization optoelectronic or fiber displays and sensors

SUBJECT LEARNING OUTCOMES*relating to knowledge:*

- PEU_W01 Knows structure and specifics of optical path work
 PEU_W02 Has knowledge about optical phenomenon and optical elements dedicated for optical transmission
 PEU_W03 Understands and is able to describe methods of various optical network configurations and sensors using in control systems

*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	Aquittance with the subject, its program and the requirements of completion. Historical Overview	2
Lec 2	Principles of wave theory of light propagation	2
Lec 3	Dielectric light guides, properties, basic parameters, fabrication	2
Lec 4	Light-emitting diodes (LED) as the light-wave source	2
Lec 5	Properties, classifications and operational parameters of the laser and semiconductor lasers	2
Lec 6	Laser diodes (LD) as the light-wave source	2
Lec 7	Problems of effective propagation of the light wave in fiber guides	2
Lec 8	Photodiodes, phototransistors and photoresistors in detection systems of the light-wave	2
Lec 9	Digital and analog modulation of optical signals	2
Lec 10	Properties, classifications and operational parameters of the optoelectronic recorders	2
Lec 11	Properties, classifications and operational parameters of the optoelectronic displays	2
Lec 12	Properties, classifications and operational parameters of the optoelectronic sensors	2
Lec 13	Practical realization and ways to configure transmission systems dedicating for control system	2
Lec 14	Innovative use of optical phenomena employed in industry and everyday life	2
Lec 15	Summarizing and assesment	2
Total hours:		30

TEACHING TOOLS USED
N1. Lecture with use of multimedia techniques

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT		
Evaluation <i>F - forming (during semester)</i> <i>P - concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(w)	PEU_W01 PEU_W02 PEU_W03 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 SECONDARY LITERATURE: Smoliński A.; Optoelektronika światłowodowa, WKŁ, Warszawa, 1985

SUBJECT SUPERVISOR
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