

FACULTY OF ELECTRICAL
ENGINEERING**SUBJECT CARD**

Name in Polish: **Optoelektronika**
 Name in English: **Optoelectronic**
 Main field of study (if applicable): **Control Engineering and Robotics**
 Specialization (if applicable):
 Level and form of studies: **1st level, full-time**
 Kind of subject: **optional**
 Subject code: **ARR042201**
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	15		15		
Number of hours of total student workload (CNPS):	30		30		
Form of crediting:	crediting with grade		crediting with grade		
For group of courses mark (X) final course:					
Number of ECTS points:	1		1		
including number of ECTS points for practical (P) classes :			1		
including number of ECTS points for direct teacher-student contact (BK) classes:	0.70		0.70		

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Has properly founded and structured knowledge needed to understand optoelectronic phenomenon and fiber guide communication
2. Has basic knowledge of optics
3. Is able to correctly select, connect and coordinate work of optoelectronic elements in metering and communication networks
4. Is able to properly conduct research of basic passive and active optoelectronic parameters
5. Is able to work in team and understand need to constant knowledge expansion

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 EDUCATIONAL EFFECTS*relating to knowledge:*

- PEK_W01 Knows structure and specifics of optical path work
 PEK_W02 Has knowledge about optical phenomenon and optical elements dedicated for optical transmission

relating to skills:

- PEK_U01 Is able to precise purpose and scope of research, project measurement circuit and select measurement equipment
 PEK_U02 Is able to elaborate results and determine conclusions if about fiber guide condition

relating to social competences:

- PEK_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	Overview of lecture program, requirements, assessment methods	1
Lec 2	Fundamentals of wave theory of light propagation	2
Lec 3	Properties and classification of optical path and its exploitation parameters	2
Lec 4	LED and LD diodes as light wave sources	2
Lec 5	Photodiodes, phototransistors, photoresistors in light wave detection units	2
Lec 6	Active and passive auxiliary elements in wave guiding automatics	2
Lec 7	Digital and analogue modulation of optical signals	2
Lec 8	Summarizing and assesment	2
Total hours:		15

Form of classes - laboratory		Number of hours:
Lab 1	Presentation of safety regulations and internal regulations of laboratory. Assessment rules. Overview of laboratory stations	1
Lab 2	Examination of multi-connected fiber guide attenuation	2
Lab 3	Examination fiber guides attenuation	2
Lab 4	Polarization characteristic measurement	2
Lab 5	Investigation of radiation angular characteristics	2
Lab 6	Spectral characteristic measurement for photoemission elements	2
Lab 7	Investigation of matching efficiency of optical connectors	2
Lab 8	Summarizing and assesment	2
Total hours:		15

TEACHING TOOLS USED
N1. Lecture with use of multimedia techniques
N2. Laboratory with measurements traditionally arranged
N3. Preparation of tests and measurements report

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT		
Evaluation <i>F – forming (during semester) P – concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(W)	PEK_W01 PEK_W02	Evaluation test, oral or writing form
P(W)	P=F1	
F1(L)	PEK_U01	Report and preparation for laboratory assessment
F2(L)	PEK_U02	Assessment of laboratory reports
P(L)	P=0,3F1+0,7F2	

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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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
ARR042201 - Optoelectronic
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY **Control Engineering and Robotics**

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)	Subject objectives	Programme content	Teaching tool number
PEK_W01	K1AIR_ASE_W02	C.1 C.2 C.3	Lec1 Lec2 Lec3 Lec6 Lec8	N.1
PEK_W02	K1AIR_ASE_W02	C.1 C.2 C.3	Lec2 Lec4 Lec5 Lec6 Lec7 Lec8	N.1
PEK_U01	K1AIR_ASE_U02	C.3 C.4	Lab2 Lab3 Lab4 Lab5 Lab6 Lab7 Lab8	N.2
PEK_U02	K1AIR_ASE_U02	C.3 C.4	Lab2 Lab3 Lab4 Lab5 Lab6 Lab7 Lab8	N.3
PEK_K01	K1AiR_K09	C.1 C.2 C.3 C.4	Lec8 Lab1 Lab2 Lab3 Lab4 Lab5 Lab6 Lab7 Lab8	N.1 N.2 N.3