

## DESCRIPTION OF THE COURSES

- Course code: ELR1209
- Course title: OPTOELECTRONICS
- Language of the lecturer: Polish

<i>Course form</i>	<i>Lecture</i>	<i>Classes</i>	<i>Laboratory</i>	<i>Project</i>	<i>Seminar</i>
<i>Number of hours/week*</i>	2				
<i>Number of hours/semester*</i>	30				
<i>Form of the course completion</i>	<i>Written test</i>				
<i>ECTS credits</i>	2				
<i>Total Student's Workload</i>	60				

- Level of the course (basic/advanced): advanced
- Prerequisites: Physics, Fundamentals of Materials Science.
- Name, first name and degree of the lecturer/supervisor: BOŻENA ŁOWKIS, Ph.D
- Names, first names and degrees of the team's members: RYSZARD KACPRZYK, D.Sc., Ph.D.
- Year:...I.... Semester:.....2.....
- Type of the course (obligatory/optional): optional
- Aims of the course (effects of the course): Understanding of physical phenomena which take place in semiconductive materials used in optoelectronics. Acquaintance with work rules, construction and basic parameters of optoelectronic semiconductor elements. Knowledge about light guides and their application.
- Form of the teaching (traditional/e-learning): traditional
- Course description:

Scope of course covers problems of semiconducting optoelectronics. Basic physical phenomena, principle of operation, construction, electric and optic parameters, applications and development trends of semiconducting radiation detectors both integrated and discrete ones are particularly comprehensively presented. Lecture introduces also to problems of fabric optical wave-guide and possibilities of their application in science and technology

- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
1. Introduction to lectures: programme, requirements for course crediting.	1
2. Basic properties of semiconductors.	2
3. Radiative and non-radiative recombination in semiconductors.	1
4. Spontaneous and forced emission.	1
5. Photoelectric phenomena.	1

6. Semiconducting junctions, homo- and heterojunction.	2
7. Materials of optoelectronics.	2
8. Semiconductive radiation sources:	
8.1. Light-emitting diodes, homojunction, heterojunction and long-wave	2
8.2. Light-emitting diodes; parameters and characteristics	2
8.3. Semiconductive laser; principle of operation, parameters and characteristics	2
8.4. Prospects of development and application of semiconductive radiation sources.	1
9. Semiconducting radiation detectors	
9.1. Principle of operation of semiconducting photodiode	2
9.2. Discrete photodetectors	2
9.3. Integrated photodetectors, CCD included	2
9.4. Application of photodetectors.	1
10. Dielectric optical wave-guide and their types.	2
11. Information transmission by optical wave-guide.	1
12. Optical wave-guide telecommunication.	1
13. Other applications of optical wave-guide.	2

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents:
- Project – the contents:
- Basic literature:
  1. Palais J. C.; Zarys telekomunikacji światłowodowej, WKŁ, Warszawa, 1991
  2. Smoliński A.; Optoelektronika światłowodowa, WKŁ, Warszawa, 1985
  3. Midwinter J. E., Guo Y. L.; Optoelektronika i technika światłowodowa, WKŁ, Warszawa, 1995
- Additional literature:  
Journal articles and other recent publications.
- Conditions of the course acceptance/creditation: Written test successfully completion.

\* - depending on a system of studies