COURSE DESCRIPTION CARD - SYLLABUS

Course name
Optoelectronic

Course

Field of study
Electrical Engineering
Area of study (specialization)
-
Level of study
First-cycle studies
Form of study
full-time
Year/Semester
3 / 6
Profile of study
general academic
Course offered in
polish
Requirements
compulsory

Number of hours

Lecture
0
Laboratory classes
15
Other (e.g. online)
0
Tutorials
0
Projects/seminars
0

Number of credit points

1

Lecturers

Responsible for the course/lecturer:
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Responsible for the course/lecturer:
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Prerequisites

Student starting this item should have basic knowledge of semiconductors, optics, electrotechnics, electronics and metrology. Also should have ability to realize the efficient self-education in the area related to the chosen field of study and have awareness of the necessity of broadening of the competence in the field of electrical engineering and willingness to cooperate in a team

Course objective

Providing students with basic knowledge in the field of optoelectronics and photonics useful in the design and application process min. in control and measurement, telecommunications, industrial and sensory systems.

Course-related learning outcomes

Knowledge

- has knowledge about the properties of optical radiation

- has knowledge about generation, transmission and detection of optical signals

- has knowledge of basic optoelectronic elements, their properties, parameters and applications

- has knowledge about construction and operation of optoelectronic devicesStudent:

Skills

Student:

- is ability to characterize the importance and scope of the optoelectronics

- is ability to plan and accomplish a simple engineering task by the use of the selected basic optoelectronic elements

Social competences

Student appreciates the possibilities of using optical radiation to solve technical problems. Student is especially understanding the need of formulating and information of the relating achievements of optoelectronics and photonic engineering and bringing it clearly into general use. Is aware of the safe handling of strong sources of optical radiation and the risks it may cause to the environment.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Laboratory exercises:

- continuous estimating with the tests,

- awarding the skill increase,

- the evaluation of knowledge and skills connected with the measuring tasks and prepared reports

Getting additional points for the activity during classes, in particular:

- the efficiency of the use of acquired knowledge to solve a given problem;

- skill of the co-operation within the team practically realizing a given detailed task in the laboratory;

- remarks connected with the improvement of didactic materials;

- the aesthetic qualities of the reports

Programme content

Laboratory exercises:

Realizacja pracy w zespołach i wykonywanie eksperymentów obejmujących:

- Acquisition and transmission of measuring information by optical link.

- Fibre-optic cables.

- Optoelectronic separation of signals.

- Measurement of selected photoemiters and photodetectors parameters.

- Accuracy of optoelectronic measurements.

Teaching methods

Laboratory exercises: teamwork and performing experiments including: the connection of a measuring system, measuring the indicated quantities, preparing a report.

Bibliography

Basic

1. K. Booth, S. Hill, Optoelektronika WKŁ, Warszawa 2001

2. Z. Bielecki, A. Rogalski - Detekcja sygnałów optycznych, WNT, Warszawa 2001

3. B. Ziętek, Optoelektronika, Wydawnictwo Uniwersytetu Mikołaja Kopernika, 2011

4. R. Jóźwicki, Podstawy inżynierii fotonicznej, Oficyna Wyd. Politechniki Warszawskiej, Warszawa 2006

5. Z. Kaczmarek - Światłowodowe czujniki i przetworniki pomiarowe, Agenda Wydawnicza PAK, Warszawa 2006

6. R. Jóźwicki - Technika laserowa i jej zastosowania, Oficyna Wyd. Politechniki Warszawskiej, Warszawa 2009

7. M. Miłek, Metrologia elektryczna wielkości nieelektrycznych, Oficyna Wydawnicza Uniwersytetu Zielonogórskiego, 2006

Additional

1. A. Cysewska-Sobusiak - Podstawy metrologii i inżynierii pomiarowej, Wyd. Politechniki Poznańskiej, Poznań 2010

2. A. Cysewska-Sobusiak - Modelowanie i pomiary sygnałów biooptycznych, Wyd. Politechniki Poznańskiej, Poznań 2001

3. Szlaferek M., Parzych J., Układy chłodzenia diod i matryc LED, Poznan University of Technology Academic Journals,Electrical Engineering No 88, Computer Applications in Electrical Engineering 2016, Poznan 2016, s. 273-287

4. Parzych J., Hulewicz A., Krawiecki Z., Matryce światłoczułe - właściwości, parametry, zastosowania, Poznan University of Technology Academic Journals, Electrical Engineering, No 92, Poznań 2017, s. 189-204

5. J. Siudak - Wstęp do współczesnej telekomunikacji światłowodowej, WKŁ, Warszawa 1999

Breakdown of average student's workload

	Hours	ECTS
Total workload	35	1,0
Classes requiring direct contact with the teacher	25	1,0
Student's own work (literature studies, preparation for laboratory classes/~~tutorials~~, preparation for tests/~~exam~~, ~~project preparation~~) [1]	15	1

[1] delete or add other activities as appropriate