STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Optoelectronics		**1010321261010321412**
Field of study	Profile of study (general academic, practical)	Year /Semester
Electrical Engineering	**(brak)**	**3 / 6**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Measurement Systems in Industry and	**polish**	**obligatory**
Cycle of study:	Form of study (full-time,part-time)	
First-cycle studies	**full-time**	
No. of hours		No. of credits
Lecture: **1** Classes: **-** Laboratory: **1** Project/seminars: **-**		**2**
Status of the course in the study program (Basic, major, other)	(university-wide, from another field)	
(brak)	**(brak)**	
Education areas and fields of science and art		ECTS distribution (number and %)
technical sciences		**2 100%**
Technical sciences		**2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of semiconductors, optics, electrotechnics, electronics and metrology
2	**Skills**	Ability to realize the efficient self-education in the area related to the chosen field of study
3	**Social competencies**	Awareness of the necessity of broadening of the competence in the field of electrical engineering and willingness to cooperate in a team

Assumptions and objectives of the course:

- Knowledge of fundamentals of optoelectronics and photonics and the selected applications of modern optoelectronic devices and equipment

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Ability to characterize the importance and scope of the optoelectronics and its current trends to developing - [K_W14 ++]
2. Knowledge of the principles of selecting the elements to be used in a simple system for the generation, transmission detection of optical signals - [K_W18+]

Skills:

1. Ability to use the basic optoelectronic devices according to their operation manuals - [K_U17 ++]
2. Ability to plan and accomplish a simple engineering task by the use of the selected basic optoelectronic elements - [K_U21 ++]

Social competencies:

1. Awareness of social part of the graduate of the technical university, and especially understanding the need of formulating and information of the relating achievements of optoelectronics and photonic engineering and bringing it clearly into general use - [K_K05 ++]

Assessment methods of study outcomes

Lectures:

- evaluation of the knowledge with a written test related to the content of lectures (test, computational and problem questions), awarding marks in laboratory exercises)
- continuous estimation in all classes (awarding attendance in lectures, activity and quality of perception).

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

Course description

- Tendency to development in the area of optoelectronics and photonics.
- Influence of optical radiation on elements of the matter.
- Selected photoemitters and photodetectors.
- Basics of laser technique.
- Fibre-optic cables.
- Acquisition and transmission of measuring information by optical links.
- Industrial fiber-optic links.
- Optoelectronic separation of signals.
- Accuracy of optoelectronic measurements.

Basic bibliography:

1. A. Cysewska-Sobusiak - Podstawy metrologii i inżynierii pomiarowej, Wyd. Politechniki Poznańskiej, Poznań 2010
2. Z. Bielecki, A. Rogalski - Detekcja sygnałów optycznych, WNT, Warszawa 2001
3. K. Booth, S. Hill - Optoelektronika WKŁ, Warszawa 2001
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

Additional bibliography:

1. A. Cysewska-Sobusiak - Modelowanie i pomiary sygnałów biooptycznych, Wyd. Politechniki Poznańskiej, Poznań 2001
2. R. Jóźwicki - Technika laserowa i jej zastosowania, Oficyna Wyd. Politechniki Warszawskiej, Warszawa 2009
3. J. Siudak - Wstęp do współczesnej telekomunikacji światłowodowej, WKŁ, Warszawa 1999
4. A. Szwedowski, R. Romaniuk - Szkło optyczne i fotoniczne, WNT, Warszawa 2009
5. W. Żagan - Podstawy techniki świetlnej, Oficyna Wyd. Politechniki Warszawskiej, Warszawa 2007
6. www.bipm.org
7. www.gum.gov.pl

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	15
2. Participation in laboratory exercises	15
3. Participation in consulting with teachers	3
4. Preparation to laboratory exercises and preparation of the raports	15
5. Preparation to a credit of lectures	5
6. Participation in a credit of lectures	2

Student's workload

Source of workload	hours	ECTS
Total workload	55	2
Contact hours	37	1

Practical activities	30	1