STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Integrated Optic Devices**		Code **1010832131010832942**
Field of study **Electronics and Telecommunications**	Profile of study (general academic, practical) **general academic**	Year /Semester **2 / 3**
Elective path/specialty **Telecommunication Systems**	Subject offered in: **Polish**	Course (compulsory, elective) **elective**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **2** Classes: **-** Laboratory: **-** Project/seminars: **1**		No. of credits **2**
Status of the course in the study program (Basic, major, other) **other**	(university-wide, from another field) **from field**	
Education areas and fields of science and art **technical sciences** **Technical sciences**		ECTS distribution (number and %) **2 100%** **2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of mathematics, EM field theory, optics, photonics and optotelekomunikacji.
2	**Skills**	Able to solve basic problems in the field of optoelectronics, electronics and telecommunications with the use of mathematical tools.
3	**Social competencies**	Understand the diversity of available technologies and their impact on the development of the ICT sector.

Assumptions and objectives of the course:

Provide students with theoretical and practical knowledge of modern integrated optics devices and subsystems.

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

Knowledge:

1. He has knowledge of the physics of operation integrated optics passive and active devices - [-K2_W08]
2. Understand the operation and construction of selected elements of integrated optics - [-K2_W08]

Skills:

1. Can define requirements and select appropriate due to the specific use integrated optics components - [-K2_U17, K2_U18]
2. Can calculate the basic parameters of the optical components - [-K2_U17]
3. Can evaluate the existing IO elements in terms of their adventages and limitations - [-K2_U17, K2_U16]

Social competencies:

1. Understands the importance of integrated optics and impact on the development of ICT - [-K2_07]

Assessment methods of study outcomes

Oral presentation

Course description

1. Planar waveguides. Waveguide modes. Types of planar waveguides.
2. Waveguide fabricatiob techniques.
3. Losses in optical waveguides.
4. Waveguide input output couplers.
5. Coupled waveguides - directional coupler.
6. Acousto-optic and electro-optic integrated modulators: principles of operation, technology.
7. Semiconductor lasers.
8. Integrated laser transmiter modules.
9. Detector modules.

Basic bibliography:

1. R. G. Hunsperger, Integrated Optics: Theory and Technology, Springer Science & Business Media, New York, 2009
2. B. Ziętek, Optoelektronika, UMK, Toruń, 2004

Additional bibliography:

1. http://www.rp-photonics.com/encyclopedia.html

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	30
2. Project	30
3. Self or teamwork on project	8
4. Prezenation	2

Student's workload

Source of workload	hours	ECTS
Total workload	65	2
Contact hours	50	2
Practical activities	30	1