STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Current Research Problems in Optical Networking**		Code **1010803111010824613**
Field of study **Communications Technologies**	Profile of study (general academic, practical) **general academic**	Year /Semester **1 / 1**
Elective path/specialty **-**	Subject offered in: **Polish**	Course (compulsory, elective) **elective**
Cycle of study: **Doctoral studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **15** Classes: **-** Laboratory: **-** Project/seminars: **-**		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 %) **100 2%** **100 2%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	PhD candidate has basic knowledge about optical elements and devices used in telecommunication networks, architecture and operation of optical networks.
2	**Skills**	PhD candidate can design logical and physical topologies of optical networks, can evaluate and chose appropriate elements for designed optical networks.
3	**Social competencies**	PhD candidate can independently develop his/her knowledge is able to participate in the scientific discussion.

Assumptions and objectives of the course:

To make students familiar with current research problems in optical networks, to work out skills of critical analysis of research papers

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

Knowledge:

1. Advanced-level knowledge of general nature in the scope of optical networks - [SD-W01]
2. Acquaintance with important unsolved problems in the domain of optical networks - [SD-W03]
3. Knowledge on basic scientific research methods in the scope of optical network - [SD-W04]

Skills:

1. Can recognize basic research problems in the scope of optical networks - [SD-U01]
2. Can find and evaluate recent information concerning research works in the scope of optical networks - [SD-U01]
3. Can evaluate usefulness of research methods to solve selected research problems in the scope of optical networks - [SD-U04]

Social competencies:

1. Can lead scientific discussion - [UD-K01]
2. Can work in a team to prepare analysis of selected scientific problem - [UD-K02]
3. Recognition and appreciation of the need for continuous improvement of professional competences - [SD-K01]

Assessment methods of study outcomes

Presentation by students results of bibliographic study on selected porblem in the scope of optical networks

Exam consisting of the open questions in the scope of the subject (5 questions, one form each subjects presented during lectures).

Course description

Repetition of basic knowledge about structures, architecture and operation of optical networks:

? Architecture and examples of optical networks
? Elements and devices used in optical networks
? Control in optical networks
? Sygnalling in optical networks

Current research problems in the scope of optical network design:

? Basic optical network topologies
? Design methods
? Trends in network architecture and design methodology

Current research problems in the scope of protection and restoration in optical networks:

? Protection and restoration methods in optical networks
? Protection design methods in optical networks

Current research problems in the scope of optical network node architectures:

? Types and structures of optical switching nodes
? Switching network structures
? current research problems in switching network structures

Current research problems in the scope of optical network control:

? Control methods in optical networks
? Basic control algorithms
? current research problems

Basic bibliography:

1. Selected papers in scientific journals and conferences like Journal of Lightwave Technology, Journal on Optical Communication and Networking, Optical Networks Modeling and Design, etc.

Additional bibliography:

Result of average student's workload

Activity	Time (working hours)
1. Lectures	15
2. Literature self-study	15
3. Preparation of presentation	5
4. Consultation	5
5. Preparation to exam	10
6. Exam	2

Student's workload

Source of workload	hours	ECTS
Total workload	52	2
Contact hours	22	1
Practical activities	0	0