



COURSE DESCRIPTION CARD - SYLLABUS

Course name

PO 6.1.2 Optyczne łącza dostępne - EC 6.1.2 Optical Access Links

Course

Field of study
Teleinformatics

Year/Semester
3/6

Area of study (specialization)

Profile of study
general academic

Level of study
first-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
15

Other (e.g. online)

Tutorials
0

Projects/seminars
0/0

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

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Prerequisites

Knowledge in the field of fiber optic technology. Knowledge of fiber optic ICT networks. Ability to work with English-language technical literature.



Course objective

Providing students with basic knowledge of optical access networks technology.
Developing students' skills in solving basic and design problems in the field of fiber optic access networks.
Shaping students' skills in acquiring knowledge about ICT networks.

Course-related learning outcomes

Knowledge

Has knowledge of the properties and operation of passive and active elements used in fiber optic access networks
Has knowledge of fiber optic systems and technology
Has ordered and theoretically founded knowledge of passive and access fiber optic networks

Skills

He can make a multi-variant selection of the type and architecture of a fiber optic network that meets the design assumptions
Can, in accordance with the assumptions, carry out the selection of the components of the designed network
Can analyze the transmission properties of the photonic layer of the network

Social competences

Is aware of the responsibility for their own work and is able to comply with the rules of teamwork

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lecture is verified on a written test or oral form.
The set of final problems is sent to students by e-mail and / or posted on the didactic platform.

The written form is carried out as a test containing about 20 questions or may consist of an individual conceptual and design case study problem covering most of the lecture topics.
The test threshold is: 50% of the points.

The practical part is assessed on the basis of reports. The final grade is the average of the grades obtained.

Programme content

Introduction to optical access networks.
Basics of optical fiber communications.
Definitions and units. Optical waveguides. Fiber attenuation. Optical information capacity - dispersion effects. Nonlinear effects. Power budget. System dynamics.



Network passive optical components. Optical splitters. Selective elements. WDM mux. OADM. Optical connectors. Optical isolators. Cables for optical networks.

Active devices.

Photodiodes and optical receivers. Transmitters, semiconductor lasers, modulators.

Modulation and detection of optical signals.

Direct modulation. Intensity modulators: electroabsorption, based on Mach-Zehnder interferometer configuration.

Architecture of fiber optic networks.

FTTP networks.

Architecture of FTTP networks. Services. WDM FTTP PON.

Designing FTTH networks.

Requirements specification. Link power budget. System capacity - rise time budget.

Installation and testing of FTTH networks.

Teaching methods

Lecture: multimedia presentation.

Practical exercises: calculation examples and computer simulations.

Bibliography

Basic

R. Ramaswami, K. Sivarajan, G. Sasaki Optical Networks, A Practical Perspective, Elsevier, 2010

J. Prat, Next-Generation FTTH Passive Optical Networks, Springer, 2008

G. Keiser, FTTH concepts and applications, John Wiley & Sons, 2006

N. Kashima, Passive Optical Components for Optical Fiber Transmission, Artech House, 2005

Additional

J. Siuzdak, Systemy i sieci fotoniczne, WKŁ, 2009

C. Palais, Fiber optic Communications, Pearson Prentice Hall, 2005

Breakdown of average student's workload

	Hours	ECTS
Total workload	56	3.0
Classes requiring direct contact with the teacher	30	2.0
Student's own work (preparation for tests, preparation for laboratory classes, literature studies)	26	1.0