

Course syllabus for ERASMUS+ incoming students

Course Title	
Fiber Optics in Structured Cabling Systems	
Academic Teacher	Sławomir Wolski, MSc in Engineering
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ECTS credits	5
Number of hours	120
Course code	INT-IPMT-FOSCS-26
Course description	
Basic knowledge about fiber optics technology used in structured cabling system. Introduce students to the basic properties of optical fibers. Introduce students to the most important applications of optical fibers. Gain knowledge about the most important optoelectronic devices in the network with optical fibers, such as light sources and detectors. Gain knowledge about various passive elements of the optical fiber transmission link. Class format: traditional (on-site), workshops and product presentation.	
Learning outcomes - course content	
1. What is the structured cabling system? 2. Introduction, classification of optical fibers. 3. Basic properties of optical fibers. Optical fiber structure, Analysis using geometric optics methods. Mode properties of optical fibers. 4. Typical parameters of fiber optics: attenuation, dispersion, and other properties. 5. Methods of manufacturing optical fibers. 6. Basics of integrated optoelectronics. Light sources. Detectors. 7. Transmission in optical fibers – active and passive devices in fiber optic links. 8. Data transmission protocols in fiber optic networks. 9. Fiber optic cables. 10. Passive elements in optical fiber links – product presentation. 11. Measurements of optical fiber lines. 12. Telecommunications and non-telecommunications applications of optical fibers. 13. Construction and principles of fiber optic link installation.	

14. Connecting of fiber optic cores - workshops.
15. Fiber optics technology in structured cabling system.

Knowledge

1. Possesses structured and theoretically based knowledge of the fibers optics.
2. The physical basis of operation of optical telecommunications systems with fiber optics links.
3. Knows the methods of producing optical fibers.
4. Knows the typical use of optical fibers in telecommunications, information technology and mechatronics engineering as a transmission link or industrial sensor technology.
5. Has knowledge of fiber optic equipment in structured cabling system.
6. Knows the transmission speeds in a computer network built with optical fibers

Skills

1. Can terminate optical fibers using the welding method.
2. Knows how to use a analyzer to measure fiber optic links.
3. Can select fiber optic equipment in structured cabling systems.

Competences

1. Can work in the team and strive to continuously develop their knowledge.
2. Finds new vocabulary for fiber optic technology.

Student workload (self-study description)

- Taking part in classes (15 hours)
- Taking part in workshops (5 hours)
- Reading assigned literature, scientific articles, and case studies related to fiber optics technology (70 hours)
- Reviewing lecture materials and preparing for examinations (30 hours),

Literature

1. John E. Midwinter, Y. L. Guo, Optoelectronics and Fiber Optic Technology, WKŁ, 1995
2. B. Ziętek, Optoelectronics, UMK Publishing House, Toruń 2004
3. A. Majewski, Fundamentals of Fiber Optic Technology, PW Publishing House, Warsaw 2000
4. M. Malinowski, Fiber Optic Lasers, PW Publishing House, Warsaw 2003
5. P. Zapała, R. Bardo, S. Rybarczyk, Network through Fiber Optics, PW Publishing House, Warsaw 2012

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| <p>6. J. Kuszczak, The Beginnings of Fiber Optic Technology, Białystok University of Technology, 2015</p> |
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