POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)
pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Networking Technologies

Course

Field of study	Year/Semester
Electronics and Telecommunications	I/I
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
Second-cycle studies	English
Form of study	Requirements
full-time	elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
30	30	
Tutorials	Projects/seminars	
0	0/0	

Number of credit points
5

Lecturers

Responsible for the course/lecturer:
prof. dr hab. inż. Wojciech Kabaciński,
Wojciech.Kabacinski@put.poznan.pl

Responsible for the course/lecturer:
dr hab. inż. Remigiusz Rajewski,
Remigiusz.Rajewski@put.poznan.pl

Prerequisites

The student should have the basic knowledge in transmission systems, probability theory, and graph theory. He should be able to obtain information from the literature, databases, and other sources in English, integrate the information, make their interpretation, draw conclusions, and justify opinions. He should also be able to communicate in English in a professional environment.

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Course objective

To familiarize students with the fundamentals of the structures and operation of different kinds of telecommunication networks, the principles of their analysis, modeling, design, and services offered by them.

Course-related learning outcomes

Knowledge

1. He has a structured knowledge in the field of telecommunication network architectures.

2. He has knowledge about the standards concerning telecommunication networks.

3. He knows the directions of telecommunication network development.

Skills

1. He understands the basic requirements of the relevant international standards for basic telecommunication networks.

2. He can evaluate typical parameters indicating the proper operation of telecommunication networks.

3. He can choose the design of some elements and equipment for telecommunication networks.

Social competences

1. He knows the limits of his knowledge and skills and understands the need for ongoing education.

2. He has awareness of the importance of telecommunication networks in the functioning of society.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge aquired during the lectures is verified by the final exam. This exam is in the oral or/and written form, depending on the number of students. The oral exam consists of a set of 5 questions, a set of questions is drawn from at least 10 sets; answer to each question is marked in 0-5 points. 50% of points are needed to pass the exam. The written exam consists of 45-60 questions of multiple choice type. Students get 1 point for the correct answer and 0 points for wrong answer or lack of answer. 50% of points are needed to pass the exam. In questionable cases, there is a possiblity to correct the mark by answering for some questions in oral.

Skills mustered during laboratory classes are evaluated based on two colloquia, in the mid and in the end of semester. To pass laboratories, both colloquia must be passed, and the final mark depend on the sum of point of both colloquia:: 5.0 from 93%; 4.5 from 85%; 4.0 from 76%, 3.5 from 65%; 3.0 from 50%; 2.0 below 50%.

Programme content

Lectures: The concept of telecommunication systems and networks. Network topologies, transfer modes, and architectures. Telecommunication networks evolution and classification. Telecommunication services: the concept of telecommunication services, classes, and attributes. Circuti switching networks: telephone networks, mobile networks. Packet switching networks: IP/TCPIP

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protocol siute. General structures and functions of switching nodes. Output contension resolution methods. Routing and call control in telecommunication networks. The basics of traffic theory: telecommunication traffic and traffic engineering models.

Laboratory: laboratory exercises cover subject on network algorithms, configuration of end devices, routers, and switches, configuration of static routing algorithms, DHSC server configration.

Teaching methods

Lectures: Lectures are conducted in the traditional form, with computer presentations that are available earlier to students. Some lectures, or their parts, are led as interactive or problem lectures, where students participate in solving some problems or examples, especially in proving of some mathematical theorems.

Laboratory: laboratory exercises cover subject on network traffic analyses, router basic congiguration, routing protocols configuration, static routing configuration, and DHCP server configuration.

Bibliography

Basic

[1]   R. L. Freeman, Fundamentals of Telecommunications, 2nd ed. John Wiley & Sons, Inc., 2005. (available from PUT network: https://onlinelibrary.wiley.com/doi/book/10.1002/0471720941)

[2]   A. Valdar, Understanding telecommunications networks. The Institution of Engineering and Technology, 2006.

[3]   T. N. Saasawi, M. H. Ammar, and A. El Hakeem, Fundamendals of Telecommunication Networks. Wiley, 1994.

Additional

[1]   J. G. van Bosse and F. U. Devetak, Signaling in Telecommunication Networks, 2nd ed. Hoboken, NJ, USA: John Wiley & Sons, Inc., 2007.

[2]   H. Akimaru and K. Kawashima, Teletraffic. Theory and Applications. London Berlin Heidelberg New York Paris Tokyo Hong Kong Barcelona Budapest: Springer-Verlag, 1993.

[3]   J. E. Flood, Telecommunication Networks, Second. The Institution of Electrical Engineers, 1997.

[5]   N. Benvenuto and M. Zorzi, Priniples of Communications Networks and Systems. John Wiley & Sons, Ltd, 2011.

[6]   H. J. Chao and B. Liu, High Performance Switches and Routers. John Wiley & Sons, Inc., 2007.

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Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,0
Classes requiring direct contact with the teacher	70	3,0
Student's own work (literature studies, preparation for laboratory classes, preparation for exam) [1]	55	2,0

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[1] delete or add other activities as appropriate