



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Structure and operation of communication networks [S1EIT1>SiDST]

Course

Field of study

Electronics and Telecommunications

Year/Semester

3/6

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

polish

Form of study

full-time

Requirements

elective

Number of hours

Lecture

30

Laboratory classes

0

Other (e.g. online)

0

Tutorials

15

Projects/seminars

0

Number of credit points

3,00

Coordinators

prof. dr hab. inż. Wojciech Kabaciński
wojciech.kabacinski@put.poznan.pl

Lecturers

Prerequisites

The student knows the basic concepts of digital modulation, transmission systems and has basic knowledge of probability theory and graph theory. Can obtain information from literature and databases and other sources in Polish or English; can integrate the obtained information, interpret it, draw conclusions and justify opinions. He can communicate in Polish or English in a professional environment and in other environments. He knows the limitations of his own knowledge and skills, understands the need for further training.

Course objective

Familiarizing students with the basics of telecommunications networks operation, principles of their analysis, modeling and design and the services provided on these networks.

Course-related learning outcomes

Knowledge:

He knows the terms characterizing telecommunications networks and understands the technical meaning of these terms. Has structured basic knowledge of the structure, functioning and standards of various types of telecommunications networks. He knows the basics of traffic engineering, the theory of queues, services,

devices, management systems, protocols and telecommunications techniques that are used in telecommunications networks.

Skills:

He is able to solve basic problems of telecommunications networks using mathematical apparatus, in particular probability. He can solve typical issues related to traffic engineering and parameterization of telecommunications networks and devices. can obtain information from literature, databases and other sources in Polish or English; can integrate the obtained information, interpret it, draw conclusions and justify opinions. Can communicate in Polish or English in professional environments. he can educate yourself.

Social competence:

He knows the limitations of his own knowledge and skills, understands the need for further training. He is aware of the need for a professional approach to solving technical problems and taking responsibility for the technical solutions he proposes. Has a sense of responsibility for the designed telecommunications networks and is aware of the potential dangers for other people or society if they are not used properly. Can formulate opinions on the basic challenges faced by modern telecommunications.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lectures is verified during an oral and/or written exam. The oral exam requires the student to provide correct answers to questions asked by leading questions. In the written part, the exam is the final passing test. The test consists consists of 45-60 test questions. Each question has four answers to choose from, one of which is correct. The student receives 1 point for a correct answer and 0 points for an incorrect answer or no response. Passing the test from 50% of the points. For students with a close number of credits an additional oral question is possible.

The knowledge and skills acquired during the classes are verified on the basis of activity in class and the grade obtained on the final test. The test is in the form of tasks to be solved. Passing the final test from 50% of the points obtained.

Programme content

Lectures:

The concept of a telecommunications system. The concept of a telecommunications network. Network resources. Functions network elements. Network classification: topologies, applications. Telephone networks, integrated, mobile and telecommunications. Hierarchical and non-hierarchical structures of telecommunications networks.

Traffic targeting strategies. Fundamentals of traffic theory: telecommunications traffic, basic models traffic engineering. Signaling systems in networks. Network connection management telecommunications (setting up, disconnecting, maintenance). Commutation methods and techniques.

Knots

commutation. Principles of numbering and addressing in telecommunications networks. Call pricing rules in telecommunications networks. Implementation of number portability in telephone networks.

Exercises:

Calculation exercises on the basis of the theory of telecommunications traffic.

Teaching methods

Lecture: traditional lecture with a multimedia presentation supplemented with examples on the board. Classes: solving tasks from the basics of telecommunications traffic theory and engineering.

Bibliography

Basic

1. A. Jajszczyk: Wstęp do telekomutacji, WNT, 2009.
2. W. Kabaciński, M. Żal: Sieci telekomunikacyjne, WKŁ, 2008.

Additional

1. M. Stasiak, M. Głąbowski, P. Zwierzykowski: Modelowanie i wymiarowanie ruchomych sieci

bezprzewodowych. Wydawnictwo Komunikacji i Łączności, Warszawa 2009.

2. M. Stasiak, M. Głąbowski, S. Hanczewski, P. Zwierzykowski: Podstawy inżynierii ruchu i wymiarowania sieci teleinformatycznych, Wydawnictwo Politechniki Poznańskiej, Poznań, 2009.

3. V.B. Iversen(ed.): Teletraffic Engineering, Handbook, ITU, Study Group 2, Question 16/2 Geneva, January 2005, on-line.

Breakdown of average student's workload

	Hours	ECTS
Total workload	90	3,00
Classes requiring direct contact with the teacher	55	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	35	1,00