



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Introduction to telecommunications

Course

Field of study

Electrical engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

4/7

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

14

Laboratory classes

7

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr inż. Jerzy Frackowiak

Responsible for the course/lecturer:

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Electronics

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Prerequisites

Knowledge in mathematics (including series of trigonometric functions with fixed coefficients - Fourier), basics of computer science, electromagnetic field.

Course objective

Understanding theoretical and practical issues related to the basic techniques of information transmission in wired and wireless telecommunications systems. Introduction to the issue of waves and antennas and radio transmission systems. Acquiring practical skills in measuring and analyzing parameters: antenna systems, transmission lines and examples of analog and digital filters.



Course-related learning outcomes

Knowledge

He knows the methods of analog and digital modulation.

Has the need to use the processes of sampling, quantization, coding and modulation of signals in the transmission of information.

He knows the description and structure of analog (passive and active) and digital filters.

He knows the types of antennas and their parameters.

Skills

Can define the concepts of sampling, quantization and coding of signals in data transmission, interpret the frequency spectra of signals, apply knowledge of the basic scope of analog and digital modulation.

Social competences

Has the ability to work in a team, openness to the use of modern telecommunications techniques.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: assessment of knowledge and skills demonstrated during the combined exam: test and problem 90 minutes.

Laboratory: reports on laboratory exercises.

Programme content

Introduction to information theory, types of telecommunications systems, analogue signal processing (discretization, quantization), spectral representation of signals, analogue modulation techniques, pulse modulation, noise and their significance in data transmission in telecommunications systems, analogue and digital low-pass filters, measurements of selected parameters and antenna characteristics.

Teaching methods

Lecture: multimedia presentation (including drawings, photos, animations, films) supplemented with examples given on the board.

Laboratory:

Exercise 1. Analog (AM, FM) and digital (BASK, BPSK, BFSK) modulations.

Exercise 2. Analog active low-pass filter.

Exercise 3. Frequency analysis of selected electrical signals.

Exercise 4. Directional characteristics of selected antennas.

performance of reports on exercises performed, assessment of reports by the laboratory leader, discussions on comments, work in teams.



Bibliography

Basic

Gotfryd M., Podstawy telekomunikacji. Telekomunikacja analogowa i cyfrowa, Oficyna Wydawnicza Politechniki Rzeszowskiej, Rzeszów 2010.

Kowalik R., Pawlicki C., Podstawy teletechniki dla elektryków, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2006.

Read R., Telekomunikacja, WKŁ, Warszawa 2000.

Additional

Zieliński T. P., Cyfrowe przetwarzanie sygnałów. Od teorii do zastosowań, WKiŁ, Warszawa 2007.

Szabatin J., Podstawy teorii sygnałów, WKiŁ, Warszawa 2007.

Szóstka J., Fale i anteny, WKiŁ, Warszawa 2009.

Haykin S., Systemy telekomunikacyjne. Część I, WKiŁ, Warszawa 2004.

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	3,0
Classes requiring direct contact with the teacher	25	1,0
Student's own work (literature studies, preparation of the final paper, preparation of thesis presentation) ¹	35	2,0

¹ delete or add other activities as appropriate