



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of telecommunications

Course

Field of study

Electrical Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

2/4

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

20

Laboratory classes

10

Tutorials

Projects/seminars

Other (e.g. online)

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

Prerequisites

Knowledge of mathematics (including Fourier series), 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

Analog and digital modulation methods

the need to use sampling, quantization, coding and signal modulation processes in information transmission

description and construction of analog (passive and active) and digital filters

antenna types and their parameters

Skills

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

evaluate the possibilities of using specific information transmission techniques in issues implemented by an electrical engineer

Social competences

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

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 (drawings, photos, animations) supplemented by 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

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	75	3,0
Classes requiring direct contact with the teacher	35	1,0
Student's own work (literature studies, preparation for laboratory classes, preparation for tests) ¹	40	2,0

¹ delete or add other activities as appropriate