



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of Telecommunications [N1Energ1>PT]

Course

Field of study

Power Engineering

Year/Semester

2/4

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

polish

Form of study

part-time

Requirements

compulsory

Number of hours

Lecture

20

Laboratory classes

10

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

3,00

Coordinators

dr inż. Jerzy Frąckowiak

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Lecturers

Prerequisites

Knowledge of mathematics (including Fourier series) and electromagnetic field, basics of programming in the MatLab system (syntax modeled on the C language)

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. he is able to assess the possibilities of applying specific information transmission techniques in problems carried out by an electrical engineer.

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:

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

Laboratory: knowledge assessment on a short written test concerning the performed exercise, preparation of exercise reports, assessment of reports by the laboratory teacher, discussion of comments.

Programme content

Lecture:

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.

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.

Teaching methods

Lecture:

Multimedia presentation (drawings, photos, animations) supplemented by examples in the MatLab system.

Laboratory:

Work in teams, discussions over comments.

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	3,00
Classes requiring direct contact with the teacher	35	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	40	2,00