



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Electrotechnics and electronics

Course

Field of study

Chemical and process engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/4

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

dr inż. Leszek Kasprzyk

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Instytut Elektrotechniki i Elektroniki

Przemysłowej

ul. Piotrowo 3A, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Has basic knowledge at the academic level in mathematics and physics. Has the ability to use his knowledge to analyze phenomena in electricity and magnetism.

Course objective

Acquiring basic knowledge and skills in the field of electrical engineering (in particular the theory of circuits - direct and sinusoidal alternating current) and electronics. Understanding the theoretical and practical issues related to the construction of safe operation and operation of electrical equipment.

Course-related learning outcomes

Knowledge

Has knowledge of electrical and electronic systems, knows the laws and methods of analyzing DC and AC



electrical requirements, single and multi-phase. Knows the methods of testing electrical and electronic circuits. [K_W06, K_W07]

Skills

Able to apply knowledge of electrical engineering and electronics, necessary to determine the parameters and signals of electrical circuits such as voltages, currents, impedances, powers, energies, etc. [K_U02]

Can obtain information from literature and the Internet, work individually, solve basic problems in the field of electrics and electronics. [K_U01]

Social competences

Is able to think and act in an entrepreneurial manner in the area of the basics of electrical engineering. Understands various aspects and effects of an engineer's activities. [K_K02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during the lecture is verified during the exam consisting of 5-10 questions (open) equally scored. Passing threshold: 50% of points. Final issues on the basis of which questions are prepared will be sent to students by e-mail using the university e-mail system or through the Moodle system.

Programme content

Basic quantities and laws regarding the electric and magnetic field (Lorentz force, flow law, Biot-Savart law, Faraday electromagnetic induction phenomenon, Maxwell equations), environments and electric signals and their classification, basic concepts of electric circuits with concentrated and distributed parameters, circuit elements, principles of voltage and current sagging, laws of electric circuits, methods of analysis of direct and sinusoidal alternating current circuits (Kirchhoff's law, eyelet currents, nodal potentials), active, reactive and apparent power, reactive power compensation, energy in electrical circuits, resonance voltages and currents, power and energy measurements in electrical circuits. Methods for analyzing DC electric circuits and 1- and 3-phase sinusoidal alternating current. Power measurements in 3-phase circuits. Transformers. AC motors. Diodes and rectifying circuits. Bipolar and unipolar transistors. Protection against electric shock.

Teaching methods

Multimedia presentation, illustrated with examples on the board, initiating discussions during the lecture. Additional materials are placed in the Moodle system.

Bibliography

Basic

1. Opydo W.: Elektrotechnika i elektronika dla studentów wydziałów nieelektrycznych. Wyd. Politechniki Poznańskiej. Poznań. 2012.
2. Opydo W., Kulesza K., Twardosz G: Urządzenia elektryczne i elektroniczne. Wyd. Politechniki



Poznańskiej. Poznań. 2015.

3. Horowitz P., Hill W.: Sztuka elektroniki. WKiŁ. Warszawa 2006. Cz.1 i 2.

4. Cysewska-Sobusiak A.: Podstawy metrologii i inżynierii pomiarowej. Wyd. Politechniki Poznańskiej. Poznań. 2010.

Additional

1. Cieśliski K., Syrzycki A.: Zbiór zadań z elektrotechniki ogólnej. Oficyna wydawnicza Politechniki Warszawskiej. Warszawa. 2007.

2. Bolkowski S: Teoria obwodów elektrycznych. WNT. Warszawa. 2008.

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,0
Classes requiring direct contact with the teacher	40	2,0
Student's own work (literature studies, preparation for tests) ¹	20	1,0

¹ delete or add other activities as appropriate