



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Electrotechnics [S1IBio1E>Elekt]

Course

Field of study

Biomedical Engineering

Year/Semester

1/2

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

English

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other

0

Tutorials

0

Projects/seminars

0

Number of credit points

2,00

Coordinators

dr inż. Łukasz Macyszyn

lukasz.macyszyn@put.poznan.pl

Lecturers

Prerequisites

Basic knowledge in mathematics, physics and chemistry. Systematized theoretical knowledge in the field of study. The student knows how to operate on complex variables, solve systems of linear equations and use literature (gaining new knowledge from the indicated sources) and the Internet.

Course objective

Acquiring knowledge about the principle of operation of electrical machines and devices, ability to analyze and solve equations describing simple electrical systems.

Course-related learning outcomes

Knowledge:

Student has knowledge in the field of electrical engineering used for the design and analysis of electric drive systems and machine control systems

Skills:

1. Student has the ability to self-study, incl. to "raise" professional competences.
2. Student is able to measure basic physical quantities, analysis of physical phenomena and solve

technical issues on the basis of the laws of physics.

3. Student is able to design and analyze electric drive systems and machine control systems.

Social competences:

Student is aware of the social role of a technical university graduate, and in particular understands the need for formulation and transfer to the public, in particular through the mass media, information and opinions on the achievements of technology and other aspects of engineering activities; endeavors to provide such information and opinions in a generally understandable way.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written exam covering theoretical knowledge with computational elements of DC and AC circuit in the form of multiple-choice test with 10-15 questions. Assessment: 3,0 <50%;60%), 3,5 <60%;70%), 4,0<70%;80%), 4,5<80%;90%), 5,0 <90%;100%).

Current control of preparation for laboratories, final test from the laboratory consisting of 5-7 multiple-choice questions. Ratings: 3.0 <50%; 60%), 3.5 <60%; 70%), 4.0 <70%; 80%), 4.5 <80%; 90%), 5.0 < 90%, 100%).

Programme content

The course covers the fundamentals of electrical engineering practice and analysis. It includes topics on measurements in DC and AC circuits, enabling students to acquire skills in recording and interpreting results. Participants will also learn techniques for simulating simple electrical circuits, allowing for virtual modeling and analysis of their operation.

The program includes the study of the operation of an induction motor in a single-phase network, the basic principles of power regulators, and the design and application of DC power supplies. This provides students with knowledge of essential devices used in engineering practice.

Course topics

Lecture:

- The effects of electricity on the human body,
- Electric current,
- Electrical measurement,
- DC and AC electric circuits,
- Methods for solving electrical circuits,
- Electric resonance imaging,
- Electric field, magnetic field and electric machines.

Lab:

- Basic measurements in DC circuits,
- Basic measurements in AC circuits,
- Simulation of simple electrical circuits,
- Induction motor in a single-phase network,
- Power controllers,
- DC power supply

Teaching methods

Lecture: presentation, solving electrical circuits calculation examples.

Laboratory: laboratory exercises in groups, class reports.

Bibliography

Basic:

1. W. Opydo, Elektrotechnika i elektronika dla studentów wydziałów nieelektrycznych, WPP, Poznań, 2012 r.
2. S. Bolkowski, Elektrotechnika 4, WSiP, 1995 r.

Additional:

1. W. Orlik, Egzamin kwalifikacyjny elektryka w pytaniach i odpowiedziach
2. B. Miedziński, Elektrotechnika. Podstawy i instalacje elektryczne, Wydawnictwo Naukowe PWN, Warszawa 1997 r.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00