

## COURSE DESCRIPTION CARD - SYLLABUS

Course name  
Electrotechnics

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### Course

Field of study	Year/Semester
Biomedical engineering	1/2
Area of study (specialization)	Profile of study
-	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
full-time	compulsory

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### Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	15	0
Tutorials	Projects/seminars	
0	0	

### Number of credit points

2

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### Lecturers

Responsible for the course/lecturer:  
dr inż. Marcin Pelic  
Institute of Mechanical Technology  
Faculty of Mechanical Engineering

Responsible for the course/lecturer:

### 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

### 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	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	20	1,0

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<sup>1</sup> delete or add other activities as appropriate