

Course title: Electronics (for mechatronics)

ECTS credit allocation (and other scores): 4,5

Semester: spring

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 75

Course coordinator/ Department and e-mail: Seweryn Lipiński; Department of Electrical Engineering, Power Engineering, Electronics and Automation; seweryn.lipinski@uwm.edu.pl

Type of classes: classes and lectures

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Substantive content

Knowledge: Knowledge of the electronics components and design/analysis of electronic circuits.

Skills: Ability to design, simulate and test a simple electronic circuit.

Social Competencies: Understanding the need for lifelong learning and ability to work in a team.

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On completion of the study programme the graduate will gain:

CLASSES: Health and safety rules in electronics laboratory, basics of metrology in electronics, transistor amplifiers, designing and simulation of linear power supplies, designing electrical signal generators, analysis and simulation of circuits based on operational amplifiers, designing active filters using operational amplifiers, prototyping and simulating systems using integrated circuits, prototyping electronics circuits with the use of breadboards, prototyping circuits with the use of hardware description languages.

LECTURES: Basic electronic components, diodes, rectifying and stabilizing circuits, transistors operation and transistor amplifiers, power amplifiers, negative feedback, phase-locked loop, designing power supplies (linear and switching), basic configurations of operational amplifiers (inverting and non-inverting amplifier, integrator and differentiator, etc.), active filters, signal generators, AD and DA converters, projects using integrated circuits, interpreting and creating schematic diagrams, hardware description languages.

Learning purpose: Gaining the knowledge about the operation and design of electronic devices.

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Basic literature: Horowitz P., Hill W.: The Art of Electronics, Cambridge University Press, 2015; Bishop O.: Electronics - Circuits and Systems, Newnes, 2007, Giblisco S.: Beginner's Guide to Reading Schematics, McGraw-Hill Education, 2018.

Supplementary literature: Sherz P., Monk S.: Practical Electronics for Inventors, McGraw-Hill Education, 2016.

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The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 75

Student's independent work: 40