



Subject card

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|---|--|--|-------------------------------------|------------|--|---------|-----|
| Subject name and code | Fundamentals of Electrical Engineering and Electronics 2, PG_00049766 | | | | | | |
| Field of study | Power Engineering | | | | | | |
| Date of commencement of studies | October 2024 | Academic year of realisation of subject | | | 2025/2026 | | |
| Education level | first-cycle studies | Subject group | | | Obligatory subject group in the field of study Subject group related to scientific research in the field of study | | |
| Mode of study | Full-time studies | Mode of delivery | | | at the university | | |
| Year of study | 2 | Language of instruction | | | English | | |
| Semester of study | 3 | ECTS credits | | | 3.0 | | |
| Learning profile | general academic profile | Assessment form | | | exam | | |
| Conducting unit | Faculty of Electrical and Control Engineering | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | prof. dr hab. inż. Piotr Chrzan | | | | | |
| | Teachers | | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 15.0 | 0.0 | 0.0 | 30 |
| | E-learning hours included: 0.0 | | | | | | |
| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | Participation in consultation hours | | Self-study | SUM | |
| | Number of study hours | 30 | 4.0 | | 41.0 | 75 | |
| Subject objectives | Introduction and analysis of fundamental electronic components, circuits and applications. | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | | Method of verification | | |
| | [K6_W03] knows the basics of automation and automatic regulation, knows the principles of the selection of electrical devices, drive systems and their control | Student defines functions and features of electronic circuits in automatic systems. Evaluates technical data of generators, oscilloscopes, multimeters and amplifiers. | | | [SW1] Assessment of factual knowledge | | |
| | [K6_W05] has structured knowledge in the field of electrical engineering and electronics, necessary to understand the basics of operation and selection of electrical machines, electricity transmission systems and power electronic devices | Student specifies properties of passive components. Possesses fundamental knowledge on semiconductor and optoelectronic devices. | | | [SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge | | |
| | [K6_K02] is able to work in a group taking different roles in it, can think and act in an entrepreneurial way, is aware of responsibility for their own work and responsibility for teamwork | | | | | | |
| Subject contents | Laboratory equipment: multimeters, oscilloscopes, measuring probes. Passive electronic components: resistors, capacitors, inductors. Semiconductors: conduction processes, doped semiconductors, pn junction, ms junction. Diodes: switching, rectifier, Schottky, Zener, photodiodes, light emitting diodes, solar panels. Transistors bipolar and unipolar: structure, operation principles, electrical data and characteristics. Optoelectronic components. Amplifiers: technical data, characteristics, influence of negative feedback. Operational amplifiers. Filters. Power amplifiers. Generators. Power supply units. Phase lock loop. Digital circuit technologies. A/C and D/ C converters. | | | | | | |
| Prerequisites and co-requisites | Fundamentals of physics and theory of electrical circuits. | | | | | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | | | Percentage of the final grade | | |
| | Test based on lectures | 50.0% | | | 50.0% | | |
| | Laboratory reports | 50.0% | | | 50.0% | | |

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| Recommended reading | Basic literature | Piotr J. Chrzan: Lectures on Electronics, https://enauczanie.pg.edu.pl/moodle/course/view.php?id=6456 |
| | Supplementary literature | Nassir H. Sabah: Electronics basic, analog, and digital with PSpice, CRC Press 2009 by Taylor Francis Group LLC, International Standard Book Number-13: 978-1-4200-8708-6 (eBook - PDF) |
| | eResources addresses | Adresy na platformie eNauzanie: |
| Example issues/ example questions/ tasks being completed | Describe main operation modes of digital oscilloscope and explain features of the passive voltage probe. | |
| Work placement | Not applicable | |