



Subject card

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|---|--|---|-------------------------------------|------------|--|---------|-----|
| Subject name and code | Electronics, PG_00038396 | | | | | | |
| Field of study | Electrical Engineering | | | | | | |
| Date of commencement of studies | October 2021 | Academic year of realisation of subject | | | 2022/2023 | | |
| 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 | Part-time studies | Mode of delivery | | | at the university | | |
| Year of study | 2 | Language of instruction | | | Polish | | |
| Semester of study | 3 | ECTS credits | | | 5.0 | | |
| Learning profile | general academic profile | Assessment form | | | exam | | |
| Conducting unit | Department of Power Electronics and Electrical Machines -> Faculty of Electrical and Control Engineering | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | prof. dr hab. inż. Piotr Chrzan | | | | | |
| | Teachers | prof. dr hab. inż. Piotr Chrzan dr inż. Krzysztof Iwan | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 20.0 | 0.0 | 20.0 | 0.0 | 0.0 | 40 |
| | 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 | 40 | 8.0 | | 77.0 | | 125 |
| Subject objectives | Knowledge and analysis of fundamental electronic components and applications. | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | | Method of verification | | |
| | K6_W05 | Student is able to perform tasks and laboratory measurements. | | | [SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects | | |
| | K6_K05 | Student knows electrical safety rules of using electronic equipment. | | | [SK5] Assessment of ability to solve problems that arise in practice | | |
| | K6_W04 | Student is able to explain and knows physical mechanisms of phenomena occurring in semiconductor materials. | | | [SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects | | |
| | K6_U08 | Student knows operation principles of elements and elementary electronic circuits. Student is able to define functions of electronic system and can design a simple electronic circuit. | | | [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject | | |
| 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. Differential and 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. Basic circuit theory. | | | | | | |

| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
|--|---|--|-------------------------------|
| | Practical exercises | 50.0% | 50.0% |
| | Written test | 50.0% | 50.0% |
| Recommended reading | Basic literature | 1. Opolski A.: Elektronika dla elektryków. Wydawnictwo PG, Biblioteka Cyfrowa PG, 2008. 2. Opolski A. (red.): Elektronika dla elektryków - Laboratorium. Wydawnictwo PG. Gdańsk 2000. | |
| | Supplementary literature | 1. Hennel J.: Podstawy elektroniki półprzewodnikowej. WNT Warszawa 2003. 2. Boksa J.: Analogowe układy elektroniczne. Wydawnictwo BTC Warszawa 2007. 3. Filipkowski A.: Układy elektroniczne analogowe i cyfrowe. WNT Warszawa 2006. | |
| | eResources addresses | Adresy na platformie eNauczanie: | |
| Example issues/ example questions/ tasks being completed | Field-effect transistors: structure, classification, graphic symbols and current-voltage output characteristics | | |
| Work placement | Not applicable | | |