



Subject card

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|---|--|---|-------------------------------------|------------------------------------|--|---------|-----|
| Subject name and code | Design Methodology and Manufacturing, PG_00048073 | | | | | | |
| Field of study | Metody projektowania i technika realizacji | | | | | | |
| Date of commencement of studies | October 2023 | Academic year of realisation of subject | | | 2025/2026 | | |
| Education level | first-cycle studies | Subject group | | | Optional subject group 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 | 3 | Language of instruction | | | Polish | | |
| Semester of study | 5 | ECTS credits | | | 1.0 | | |
| Learning profile | general academic profile | Assessment form | | | assessment | | |
| Conducting unit | Department of Metrology and Optoelectronics -> Faculty of Electronics Telecommunications and Informatics -> Wydział Politechniki Gdańskiej | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr inż. Arkadiusz Szewczyk | | | | |
| | Teachers | | dr inż. Arkadiusz Szewczyk | | | | |
| Lesson types | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15 |
| | E-learning hours included: 0.0 | | | | | | |
| | eNauczanie source addresses: Moodle ID: 46343 Metody projektowania i technika realizacji - wykład 2025/26 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46343 | | | | | | |
| 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 | 15 | 1.0 | 9.0 | 25 | | |
| Subject objectives | Give the knowledge of technology of design and manufacturing of electronic equipment. | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | Method of verification | | | |
| | [K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment | is able to design, in accordance with the given specification, and build a simple electronic device | | [SU1] Ocena realizacji zadania | | | |
| | [K6_W32] Knows the parameters, functions and methods of analysis, design and optimization of analogue and digital circuits and electronic systems | knows how to choose and apply tools and techniques for designing electronic devices. | | [SW1] Ocena wiedzy faktograficznej | | | |

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| Subject contents | 1. Basic problems of designing and engineering of electronic devices and systems. 2. Designing of electronic devices allowing requirements of manufacturing. 3. Factors determining designing and construction processes. Optimal solutions. 4. Enclosure and module systems. 5. Internal connections between modules: fixed and separable. 6. Elements with contacts; matching of modules. 7. Cabling. Parameters of cables, materials for conducting wires, isolators and shields. 8. Connection techniques: soldering, wire-wrapping, crimping. 9. Manual and automatic soldering. 10. Influence of the electronic devices mounting technology on environment; lead-free soldering, flux materials. 11. Electronic components for through-hole and surface mounting technology. 12. Surface mounting technology. Wave soldering, reflow soldering. 13. Production units for automatic mounting of electronic components. Automatic units for components positioning, for depositing of glue and solder. 14. Designing of pads. Influence of the mounting technology on printed board design. 15. Construction and techniques of printed circuit boards manufacturing. 16. Electronic Design Automation (EDA) software. 17. Preparation of fabrication documentation. 18. Grounding and shielding techniques. Designing of shields. 19. Cooling systems in electronic devices. Designing of the cooling systems and radiators for the typical power components. | | |
| Prerequisites and co-requisites | No requirements | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Writing exam | 50.0% | 100.0% |
| Recommended reading | Basic literature | Ryszard Kisiel: "Podstawy technologii montażu dla elektroników", BTC 2012 | |
| | Supplementary literature | Krystyna Bukart, Halina Hackiewicz: "Lutowanie bezołowiowe", BTC 2007 | |
| | eResources addresses | | |
| Example issues/ example questions/ tasks being completed | CAD software, soldering, PCB assembly, devices outlines, connections, grounding, shielding. | | |
| Practical activities within the subject | Not applicable | | |

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