



## Subject card

|   |   |  |  |                                     |  |            |     |
|---|---|--|--|-------------------------------------|--|------------|-----|
| Subject name and code                       | Electronic Circuits - laboratory, PG_00047581   |  |  |                                     |  |            |     |
| Field of study                              | Automatic Control, Cybernetics and Robotics   |  |  |                                     |  |            |     |
| Date of commencement of studies             | October 2025  |  | Academic year of realisation of subject  |                                     | 2026/2027  |            |     |
| Education level                             | first-cycle studies   |  | Subject group  |                                     | Obligatory subject group in the field of study<br>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  |                                     | Polish   |            |     |
| Semester of study                           | 4   |  | ECTS credits   |                                     | 1.0  |            |     |
| Learning profile                            | general academic profile  |  | Assessment form  |                                     | assessment   |            |     |
| Conducting unit                             | Department Of Microelectronic Systems -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej   |  |  |                                     |  |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  |  | dr hab. inż. Jacek Jakusz  |                                     |  |            |     |
|   | Teachers  |  | dr hab. inż. Jacek Jakusz  |                                     |  |            |     |
| Lesson types and methods of instruction     | Lesson type   | Lecture  | Tutorial   | Laboratory                          | Project  | Seminar    | SUM |
|   | Number of study hours   | 0.0  | 0.0  | 15.0                                | 0.0  | 0.0        | 15  |
|   | 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   | 15   |  | 1.0                                 |  | 9.0        | 25  |
| Subject objectives                          | knowledge of instruments and retention of theoretical knowledge on the structure and properties of electronic systems of linear electronic circuits in the student's lab.   |  |  |                                     |  |            |     |
| Learning outcomes                           | Course outcome  |  | Subject outcome  |                                     | Method of verification   |            |     |
|   | [K6_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study and perform tasks, in an innovative way, in not entirely predictable conditions, by:n- appropriate selection of sources and information obtained from them, assessment, critical analysis and synthesis of this information,n-selection and application of appropriate methods and toolsn |  | The student is able to calculate the parameters of electronic circuits and then perform their practical measurements. In this way, it strengthens the knowledge of structures and parameters of analog electronic circuits discussed during the lecture. |                                     | [SU1] Assessment of task fulfilment<br>[SU4] Assessment of ability to use methods and tools                          |            |     |
|   | [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                                  |  | The student is able to calculate the values of basic elements of transistor amplifiers.  |                                     | [SU1] Assessment of task fulfilment<br>[SU4] Assessment of ability to use methods and tools                          |            |     |
| Subject contents                            | 1. CMOS programmable array for analog circuit applications<br>2. Basic gain stages for MOS amplifiers<br>3. Amplifier with negative feedback loop<br>4. Bipolar wideband amplifiers<br>5. Differential pair amplifier<br>6. Phase-locked oscillator (PLL)<br>7. Diode rectifier and voltage regulator<br>8. Buck DC/DC converter  |  |  |                                     |  |            |     |

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| Prerequisites and co-requisites                                | Is required to pass the lecture "ELECTRONIC CIRCUITS" on the 3rd semester |   |                               |
| Assessment methods and criteria                                | Subject passing criteria  | Passing threshold   | Percentage of the final grade |
|  | Practical exercise  | 50.0%   | 100.0%                        |
| Recommended reading  | Basic literature  | Guziński A: "Liniowe elektroniczne układy analogowe", WNT, 1994<br>Tietze U., Schenk Ch.: "Układy półprzewodnikowe", WNT2009<br>Sedra A.S., Smith K.C.: "Microelectronic circuits", Oxford University Press, New York, Oxford, 2004 |                               |
|  | Supplementary literature  | No requirements   |                               |
|  | eResources addresses  | Adresy na platformie eNauczanie:  |                               |
| Example issues/<br>example questions/<br>tasks being completed |   |   |                               |
| Work placement   | Not applicable  |   |                               |

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