GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | Electronic Devices - laboratory, PG_00048812 | | |
| Field of study | Electronics and Telecommunications | | |
| 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 inż. Łukasz Gołuński | |
| | Teachers | dr inż. Łukasz Gołuński | |

**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**

Learning through experiments of the operation principles of basic semiconductor devices and learning the methods of measuring their chatacteristics, as well as learning methods of determining values of their equivalent circuits, useful in designing of electronic circuits.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|

**Subject contents**

Static characteristics of semiconductor diodes. Switching characteristics of semiconductor diodes. Properties of stabilization diodes. IV characteristics of field effect transistors and extraction of parameters for their equivalent circuits. Small signal operation of transistors for small and medium frequencies. Pulse operation and models of transistors. Characteristics and models of electroluminescent diodes and photodiodes.

**Prerequisites and co-requisites**

**Assessment methods and criteria**

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| Laboratory experiments | 50.0% | 100.0% |

**Recommended reading**

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| Basic literature | Our laboratory instruction booklets.<br><br>Ch. Papadopoulos, "Solid-State Electronic Devices: An Introduction", Springer 2014<br><br>J.-P. Colinge, C.A. Colinge, "Physics of Semiconductor Devices", Springer 2002 |
| Supplementary literature | A.S. Sedra, K.C. Smith, "Microelectronic Circuits", Oxford, 2007<br><br>Ch.C. Hu, Modern Semiconductor Devices for Integrated Circuits, Prentice Hall 2009 |
| eResources addresses | Adresy na platformie eNauczanie: |

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|---|---|
| Example issues/ example questions/ tasks being completed | Connect a circuit presented on a diagram in the instruction booklet. The output voltage value of the generator should be adjusted so that the peak-peak value of Vce is 100 mV at f = 1 kHz. Take a record of the generator voltage Vgpp. Use it to calculate the low-frequency value of h21e0. Measure and plot the dependence of \|h21e\| on frequency. Determine experimentally the fbeta value. Calculate values of the emitter-base diffusion capacitance CdifE, the common-emitter current-gain cut-off frequency fT, and the electron transit time ttn. |
| Work placement | Not applicable |

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