



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Semiconductor devices [N1EiT1>PP]

Course

Field of study

Electronics and Telecommunications

Year/Semester

2/3

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

Number of hours

Lecture

20

Laboratory classes

15

Other (e.g. online)

0

Tutorials

15

Projects/seminars

0

Number of credit points

6,00

Coordinators

dr inż. Krzysztof Klimaszewski

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Lecturers

Prerequisites

Systematized knowledge of mathematical analysis, algebra and probability. Structured, mathematically based, detailed knowledge of the basics of circuit theory necessary to understand, analyze, evaluate the operation of electrical circuits. Ability to obtain information from literature and databases and other sources in Polish or in English; the ability to integrate the information obtained, to interpret it, draw conclusions and justify opinions. Knowing the limitations of one's own knowledge and skills, understanding the need for further training.

Course objective

Acquainting students with the basic electronic components, principles of their operation and their use in electronic circuits. Presenting the knowledge about basic calculations made when designing electronic circuits.

Course-related learning outcomes

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written exam consisting of about 8 tasks, scored equally. Passing threshold: 50% of points. If necessary, the written examination may be supplemented by an oral examination. The final grade includes activity during classes - solving additional tasks.

Completion of laboratory exercises based on the evaluation of reports prepared during each class and evaluation of involvement in the course of classes.

Passing the auditorium exercises is based on the assessment of activity during classes and the assessment of control work.

Programme content

During the classes, knowledge is provided about basic electronic components, their actual properties and the way they operate.

Course topics

Lecture:

Resistors, capacitors, coils - parameters of real electronic components

Types of diodes and their applications

Bipolar transistor

JFET field effect transistor

MOSFET field effect transistor

Transistor amplifiers

Operational amplifier (ideal model and real amplifier), basic circuits using operational amplifier and comparator

Laboratory exercises:

Simple RC filters, circuits with diodes

Systems with a bipolar transistor

Circuits with JFET transistor

Linear circuits with operational amplifier

Auditorium exercises:

LED systems

Bipolar transistor polarization systems

Polarization circuits of the field-effect transistor

Transistor amplifiers

Operational amplifier in linear circuits

Teaching methods

Lecture: multimedia presentation, illustrated with examples given on the projector, seminar lecture

Laboratory exercises: execution of tasks described in the instructions in two/three-person groups, construction of circuits and performing the necessary measurements

Lectures: practical presentation of methods for calculating the parameters of sample electronic circuits, solving tasks on the board

Bibliography

Basic

„Electronic devices” (conventional current version) T. Floyd

„Semiconductor devices and analog electronics” K. Klimaszewski

Supplementary

„Sztuka elektroniki” P. Horowitz, W. Hill

„The Art of Electronics: The x-Chapters” P. Horowitz, W. Hill

„Układy półprzewodnikowe” U. Tietze, C. Schenk

„Przyrządy półprzewodnikowe” W. Marciniak

„Wzmacniacze operacyjne teoria i praktyka” B. Carter, R. Mancini

Breakdown of average student's workload

	Hours	ECTS
Total workload	130	6,00
Classes requiring direct contact with the teacher	60	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	70	4,00