COURSE DESCRIPTION CARD - SYLLABUS

Course name
Semiconductor devices and analog electronics

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 studies

Course offered in
English

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
30	45	
Tutorials	Projects/seminars	

Number of credit points

6

Lecturers

Responsible for the course/lecturer:
dr inż. Krzysztof Klimaszewski
krzysztof.klimaszewski@put.poznan.pl

Responsible for the course/lecturer:

Prerequisites

Systematic knowledge of mathematical analysis, algebra and theory of probability.

Detailed, systematic knowledge of the fundamentals of circuit theory, together with the necessary mathematical background; this knowledge allows him/her to understand, analyze and evaluate the operation of electrical circuits.

Ability to extract information from English language literature, databases and other sources.

Ability to synthesize gathered information, draw conclusions, and justify opinions.

Awarness of the limitations of his/her current knowledge and skills; is committed to further selfstudy.

Course objective

Familiarizing the students with the basic electronic components, principles of their operations and possible applications in electronic circuits. Demostrating the basic calculations required in basic electronic circuit design. Providing the basic knowledge of electronic design.

Course-related learning outcomes

Knowledge

The basic knowledge about electonic components, their properties and basic characteristics. Familiarity with basic semiconductor components. Knowledge about electronic devices applications. Familiarity with the most basic typical circuits.

Knowledge of the history and contemporary developments in application and production of electronic components.

Skills

Ability to search for required information about electronic components, select the components for basic applications, design and implement a basic circuit.

Ability to find information about new electronic components and their applications.

Ability to select appropriate components for a given application, is able to use the documentation of electronic components.

Social competences

Awarness of fast development of electronics and understands the necessity of constant development of the knowledge.

Ability to cooperate in the implementation of more complex objectives.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written exam consisting of approximately 8 tasks, equally graded. Passing the exam requires at least 50% of points. When required, the written exam may be followed by an oral exam. In the final grade also the activity during the classes is considered (homeworks).

The laboratory exercises are graded according to the reports prepared during each session, homeworks and the involvement in the lab assignments.

Programme content

Lecture:

Resistors, capacitors- real life component parameters

Diodes - different types and applications

Bipolar transistors

Field effect transistors: JFET and MOSFET

Transistor amplifiers

Operational amplifier (ideal model and real component properties), basic opamp circuits, comparator

Multistage amplifiers

Laboratories:

Component properties, measurement equipment properties

Simple RC filters

Bipolar transistor circuits

JFET transistor circuits

Operational amplifier circuits

Teaching methods

Lecture: multimedial presentation, illustrative examples presented on the board, conversatory lecture

Laboratory: execution, in two or three person groups, the tasks described in the manuals, performing manual calculations, design procedures, as instructed by the teacher, building and debugging simple circuits, performing the measurements

Bibliography

Basic

"Semiconductor devices and analog electronics" K. Klimaszewski

"Electronic devices" (conventional current version) T. Floyd

Additional

"The art of electronics" P. Horowitz, W. Hill

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

"Microelectronic Circuits" A.S. Sedra, K.C.Smith

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,0
Classes requiring direct contact with the teacher	90	4,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	60	2,0

[1] delete or add other activities as appropriate