



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Analog electronic circuits

Course

Field of study

Electronics and telecommunications

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/4

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

30

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

5

Lecturers

Responsible for the course/lecturer:

dr inż. Krzysztof Klimaszewski

krzysztof.klimaszewski@put.poznan.pl

Responsible for the course/lecturer:

Prerequisites

Knowledge of methods used for analysis of AC and DC current circuits, the ability to gather information from the literature in Polish and in English.

Course objective

Demonstration of the basic electronic components, their properties and principles of their operation and possible uses in electronic circuits. Provide knowledge on the basic aspects of the design of electronic circuits.

Course-related learning outcomes

Knowledge

Understands the principles of operation of typical circuits used in applications presented during the classes. Understands the basic principles of circuit design.

Skills

Can identify the problem and specify the design requirements of a simple analog electronic circuit. Can



describe the principle of operation of a simple electronic circuit based on its schematic. Can use the documentation of electronic components during the design of simple circuits.

Can design and build a simple electronic circuit.

Social competences

Knows the limitations of one's own knowledge and capabilities, understand the necessity of constant training. Can cooperate in the development of the more complex goals, understands the need to assume consequences of one's own decisions and acts.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written exam with approximately 8 tasks, equally graded. The passing threshold: 50% of maximum points. If necessary, the written exam may be accompanied by an oral exam. The final mark is influenced by the student active participation in the activities, i.e. homeworks.

The laboratory exercises are graded based on the reports prepared by the students and the evaluation of their activity during the laboratories.

Programme content

Lecture:

Generator circuits: relaxation, RC, LC, quartz

Feedback in amplifiers

Phase locked loop (PLL)

Differential amplifiers, multistage, selective amplifiers

Power amplifier classes

Passive and active electronic filters, switched capacitors filters

Voltage regulators - linear and switching

Thermal resistance

Analog to digital converters, digital to analog converters - principles of operation

Digital logic circuits

Basics of noise in electronic circuits

Laboratories:

Comparator, twilight switch

Nonlinear circuits and generators using opamps



Function generator

Wein bridge oscillator

Analog thermometer

Phase locked loop

Microphone amplifier

Active filters

Linear voltage regulator

Switching voltage regulator

Teaching methods

Lectures: multimedia presentation, illustrated by the examples shown on overhead projector, conversatory lecture

Laboratory exercises: executed in 2/3 student groups, following the provided manuals, groups build and measure the circuits themselves using the provided components

Bibliography

Basic

„Sztuka elektroniki” P. Horowitz, W. Hill

„Układy półprzewodnikowe” U. Tietze, C. Schenk

Additional

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

„Układy Elektroniczne Analogowe i Cyfrowe ” A. Filipkowski

„Układy Elektroniczne cz.I Układy Analogowe Liniowe” Z. Nosal , J. Baranowski

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,0
Classes requiring direct contact with the teacher	70	3,0
Student's own work (literature studies, preparation for laboratory classes, preparation for exam) ¹	55	2,0

¹ delete or add other activities as appropriate