

Construction of electronic equipment - course description

General information	
Course name	Construction of electronic equipment
Course ID	06.0-WE-ELEKTP-CEE-Er
Faculty	Faculty of Computer Science, Electrical Engineering and Automatics
Field of study	Electrical Engineering
Education profile	academic
Level of studies	First-cycle Erasmus programme
Beginning semester	winter term 2017/2018

Course information	
Semester	6
ECTS credits to win	5
Course type	optional
Teaching language	english
Author of syllabus	<ul style="list-style-type: none">dr hab. inż. Janusz Kaczmarek, prof. UZ

Classes forms					
The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	15	1	-	-	Exam
Laboratory	30	2	-	-	Credit with grade
Project	15	1	-	-	Credit with grade

Aim of the course

- To familiarize students with the principles of constructing electronic devices and developing construction documentation
- To familiarize students with selected construction solutions used in electronic equipment

Prerequisites

Materials engineering

Graphic record of the construction

Principles of electronics and power electronics

Scope

Principles and stages of the construction process: construction assumptions, preliminary design, model, technical design, prototype, production. Construction documentation.

Use of computers in the construction process.

Methodology of designing electronic devices. Modeling of electronic devices in the design process - SPICE standard.

Characteristics of selected components used in electronic equipment: resistors, capacitors, induction components, integrated circuits, displays and keyboards. Real parameters of passive and active electronic elements. Using datasheets of electronic components.

Thermal working conditions of electronic apparatus. Basic information about heat exchange in electronic equipment. Principles of selecting radiators and fans.

Classification of electromagnetic disturbances and ways to minimize them.

Printed circuit boards (PCB). Principles of PCB design. Production stages of printed circuit boards. Quality evaluation of printed circuit boards.

Constructional solutions of the selected blocks of the electronic apparatus.

Ergonomics, safety, testability, reliability of electronic apparatus.

Teaching methods

Lecture: conventional lecture

Laboratory: laboratory exercises, group work

Project: project method, discussions and presentations

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Student is able to list and characterize the basic stage of the process of constructing electronic apparatus		<ul style="list-style-type: none">a multiple choice and open questions test	<ul style="list-style-type: none">Lecture

Outcome description	Outcome symbols	Methods of verification	The class form
Student is able to select materials and components when constructing electronic equipment.		<ul style="list-style-type: none"> • a project • carrying out laboratory reports 	<ul style="list-style-type: none"> • Laboratory • Project
Student can design electronic devices with regard to ergonomics, safety and economic aspects.		<ul style="list-style-type: none"> • a multiple choice and open questions test • a preparation of a project • an ongoing monitoring during classes • carrying out laboratory reports 	<ul style="list-style-type: none"> • Lecture • Laboratory • Project
Student is familiar with issues related to interference in electronic equipment and how to minimize them.		<ul style="list-style-type: none"> • a multiple choice and open questions test 	<ul style="list-style-type: none"> • Lecture

Assignment conditions

Lecture – the passing condition is to obtain a positive mark from the final test.

Laboratory – the passing condition is to obtain positive marks from all laboratory exercises to be planned during the semester.

Project - the project documentation and oral presentation

Calculation of the final grade: lecture 30% + laboratory 40% + project 30%

Recommended reading

1. Williams T.: The Circuit Designer's Companion, Newnes, 2005
2. Williams T.: EMC for Product Designers, Elsevier, 2007
3. Rymarski Z., Materials technology and construction of electronic circuits. Designing and production of electronic circuits, Wydawnictwo Politechniki Śląskiej, Gliwice, 2000 (in Polish).

Further reading

Notes

Modified by dr hab. inż. Janusz Kaczmarek, prof. UZ (last modification: 13-04-2017 20:35)

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