HE1025 EMC Electronics 7.5 credits

EMC-elektronik

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for HE1025 valid from Autumn 2008

Grading scale

A, B, C, D, E, FX, F

Education cycle

First cycle

Main field of study

Electrical Engineering, Technology

Specific prerequisites

To be able to profit from the course, the student should have the previous basic knowledge of electric circuits, electronics and digital devices corresponding to courses: Analogue Technology, Applied Electronics and Digital Electronics at the Programme in Electrical Engineering

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The main purpose of the course is to provide good knowledge about sources of electromagnetic distortion and about known methods to restrain them. Additionally, it shall provide knowledge of CE marking of electronic products in Europe

After completing the course, the student should be able to:

- recognise the source of electromagnetic distortion
- estimate or evaluate the magnitude of emissions and interferences
- alternate an electronic circuit to eliminate or decrease the electromagnetic emission and interference.
- choose the best techniques and devices to suppress electromagnetic disturbances and apply them properly in electronic equipment or systems.
- estimate the need of the CE certificate for the electronic device, equipment or system and estimate if it fulfils the conditions

After completing the course with the best result, the student should also be able to:

- investigate the complex electronic system and suggest the necessary protection to eliminate or suppress the electromagnetic emission and interference
- redesign the electronic device, equipment or system to protect it against electromagnetic emission and interference

Course contents

- Basic electromagnetic ideas. Laws of Faraday, Ampère and Gauss. Some properties of common transmissions lines. Basic antenna theory in EMC.
- Non ideal passive components. Spectrum of signals. Electromagnetic emission and immunity. Overhearing.
- Suppression techniques. Design for immunity. Some ideas about shielding and grounding.
- EMC regulation and testing.

Course literature

Ohlin, Per & Karlsson, Ingvar, EMC Elektronik, KTH Syd, Campus Haninge, 2005

Examination

- RED1 - Assignment, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Exercises, 3.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Written exam (TEN1; 4.5 cr.), grading A-F
Practical exercises (LAB1; 3 cr.), grading P/F.
The final grade is based on the two parts. Grading A-F.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.