



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Elektronik i produkter **Electronics in Products**

EITP35, 7,5 credits, A (Second Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED E

Date of Decision: 2023-04-11

General Information

Compulsory for: E4-ac

Elective for: D4, M4, N4

Language of instruction: The course will be given in English on demand

Aim

Orient the students about the industrial conditions regarding production of electronic systems, especially with a focus on high volumes. Provide an understanding of how these conditions affect how industry designs and produces electronic products. Provide a good basis for continued learning in the industrial environment.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- An overall picture of the conditions and conditions for electronics in volume production.
- Understanding of the economic factors behind volume-produced electronics.
- Understanding of the role of electronic products in larger systems.
- Understanding of the environmental sustainability and ethical aspects of products.
- Concepts and tools for discussing and analysing aspects of sustainability and ethics.

Competences and skills

For a passing grade the student must

- Be prepared for a role in an industrial product project in the field of electronics.
- Be able to describe and discuss requirements and conditions for industrial electronic products and development projects.
- Evaluate design decisions from a product and production economic perspective.
- Be able to reason about electronic products, or systems that include electronic products, from the environmental and ethical perspectives.
- Independently be able to expand their knowledge, describe the acquired knowledge in a report, present the report orally and constructively criticize other people's reports and presentations.

Judgement and approach

For a passing grade the student must

- Be able to reflect on an electronic design solution in a broader perspective than purely functional, including from an economic, environmental and ethical point of view.
- Have the confidence to actively and independently seek information as a basis for presenting and discussing aspects, in addition to the technical ones, on electronics products and systems that include electronic products.

Contents

The course deals with electronic products, and systems that include electronic products, from a variety of perspectives:

Basic prerequisites: Electronics, the book printing art of our time

Costs in the product calculation, one-off costs and unit costs

Development efforts & verification

Components

Certification requirements

Production / assembly

Testing

Warehousing, capital tied-up and obsolescence risk

Returns

The market and its risks

The role of the product in the customer's financial outcome

Credibility as a supplier

The brand and consequences of errors

Changing circumstances

Technical excellence or good enough?

ASIC, FPGA and standard circuits

What pros and cons do each choice bring?

The right technology node for the product

Testability, finding errors early

Material and component supply

Reliability

Production readiness and production flows

Standardization, industry standards, platforms, component selection

The design process, projects and resources

Develop first and then sell – or vice versa?

Verification

The cost of failure

Regulatory framework

Patents

Licenses

Regulatory requirements

Buyer's right to the product; use, repair, change

Every perspective will be treated in such a way that technical and economic aspects are covered, but treatment also generally reflects on environmental sustainability and ethical aspects. The course requires a certain level of prior knowledge in the technical and economic fields, but not in the environmental and ethics. The course therefore introduces the concepts and tools needed to deal with these aspects early in the course.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)

Assessment: Performance assessment: Based on individual in-depth knowledge of any

sub-topic with written report and presentation in seminar form with opposition. Passing grades requires passing all the elements, report, presentation and opposition. The grade represents an equally weighted sum of the three parts.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts

Code: 0122. **Name:** Report.

Credits: 4,5. **Grading scale:** TH. **Assessment:** Based on individual in-depth knowledge of any sub-topic in the written report.

Code: 0222. **Name:** Opposition.

Credits: 1. **Grading scale:** TH. **Assessment:** Based on opposition on other project presentation.

Code: 0322. **Name:** Presentation.

Credits: 2. **Grading scale:** TH. **Assessment:** Based on individual in-depth knowledge of any sub-topic in presentation.

Admission

Assumed prior knowledge: Prior knowledge in economy/products corresponding to MIOA12 and electronics corresponding EITA35/EITA10/EITF90

The number of participants is limited to: 30

Selection: Completed university credits within the programme. Priority is given to students enrolled on programmes that include the course in their curriculum.

Reading list

Contact and other information

Course coordinator: Per Andersson, per.andersson@eit.lth.se

Course homepage: <http://www.eit.lth.se>

Further information: The Course is mandatory in the specialisation Business Electronics.