



IL131V Basic Digital Theory with PIC-processor 7.5 credits

Tillämpad digitalteknik med PIC-processor

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

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

Establishment

Course syllabus for IL131V valid from Spring 2011

Grading scale

P, F

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Completed upper secondary education including documented proficiency in Swedish corresponding to Swedish B and English corresponding to English A. Proficiency corresponding to Mathematics D/Mathematics 3c, Physics B/Physics 2 and Chemistry A/Chemistry 1.

Language of instruction

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

Intended learning outcomes

The digital workbench on your own kitchen table!

- With the help from our list of equipment and components, and some freeware programs found on the Internet, you will be able to setup your own digital workbench on your “kitchen table”.
- On the course web you will find material that will give you a basic orientation of the units that could be found on a PIC-processor, and how they work.
- Examples show you how a simple PIC-processor could be programmed with a Hardware-Near dialect of the C-language.
- During the course you solve the laboratory exercises at school with our lab equipment, or at home with what you have of own equipment.
- By individual choosing, and performing, your own programming project, you show that your equipment work, and that you can handle it!

Course contents

Binary numbers and codes. ALU, registers, memory technologies.

A description of the architecture of the chosen processor and its instructions.

Example of programming with assembler and with C.

- Program documentation with structure diagrams.
- I/O-units. Timers, CCP, Comparator, AD-converter.
- A programming project.

This is a quarter-time course, ordinary with one evening every week. The course language is Swedish. At every occasion theory is mixed with laboratory work.

At two of the occasions it's mandatory to attend, at other occasions this is optional – the detailed program of the course will help you to decide what's most efficient for you. If you study from home, you report by mail during the course.

Course literature

Kursmaterialet säljs vid kursstarten.

Examination

- INLA - Assignment, 1.0 credits, grading scale: P, F
- INLB - Assignment, 1.5 credits, grading scale: P, F
- LABA - Laboratory Works, 1.0 credits, grading scale: P, F
- LABB - Laboratory Works, 1.0 credits, grading scale: P, F
- LABC - Laboratory Works, 1.0 credits, grading scale: P, F

- PROA - Assignment, 2.0 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.

Other requirements for final grade

INLA – Hand in theory 1, 1.0 hp, P, F (online on web)

INLB – Hand in theory 2, 1.5 hp, P, F (online on web)

LABA – Laboratory exercises 1, 1.0 hp, P, F (at school or home)

LABB – Laboratory exercises 2, 1.0 hp, P, F (at school)

LABC – Laboratory exercises 3, 1.0 hp, P, F (at school or home)

PROA – Individual programming project with the PIC-processor, 2.0 hp, P, F

Your written report from the programming project, together with the final passed grade, show others what you have done during the course.

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.