



# MF2095 Programming in C for Embedded Systems 3.0 credits

Programmering i C för inbyggda styrsystem

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 MF2095 valid from Autumn 2017

## Grading scale

P, F

## Education cycle

Second cycle

## Main field of study

Mechanical Engineering

## Specific prerequisites

MF1016 Electrical engineering or the equivalent

DD1321 Applied programming and computer science or the equivalent

## Language of instruction

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

## Intended learning outcomes

After passing the course, the students should be able to:

- explain the structure of control circuits and embedded processors
- account for the function and the use of I/O ports, timers, ADC, and serial interfaces
- program the hardware in a control circuit system using C
- use and utilise development tools for programming and troubleshooting of embedded systems
- account for and utilise interrupt handling with different types of interrupts
- be able to use and program common types of displays and communication interfaces

## Course contents

The following modules are included in the course:

- Computer models, von Neumann and Harvard architecture, CISC and RISC
- The function of the micro-controller at register level
- Interrupt handling in hardware and software
- Parallel and serial interfaces
- Timers, Compare, Capture and PWM program design
- Low level programming in C
- JSP- Jackson structured programming

## Disposition

The course includes lectures, laboratory exercises and individual work.

## Course literature

Course-related literature is distributed at the beginning of the course.

## Examination

- LAB1 - Laboratory work, 1.0 credits, grading scale: P, F
- LAB2 - Laboratory work, 1.0 credits, grading scale: P, F
- LAB3 - Laboratory work, 1.0 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.

The examination of the course consists of three components in the form of laboratory sessions. Before each laboratory session, a preparatory assignment is required.

## Other requirements for final grade

Passing the course requires a pass grade for three laboratory sessions, 3 x 1 credits.

## 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.