SYLLABUS

Microcomputer engineering with space applications 7.5 credits D0001R

Mikrodatorteknik med rymdtillämpningar

Course syllabus admitted: Spring 2024 Sp 3 - Present

DECISION DATE
2023-02-15

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Microcomputer engineering with space applications 7.5 credits D0001R

Mikrodatorteknik med rymdtillämpningar

First cycle, D0001R

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Rymdteknik	Space Technology

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and Basic knowledge in programming (D0009E or D0017E).

Selection

The selection is based on 1-165 credits.

Course Aim

This course aims to give a knowledge on the structure, function, programming and usage of microcomputer systems, and basic knowledge of microcomputer applications for onboard computers and space instruments.

On completion of this course the student should:

1. show knowledge of common applications of microcomputer systems in space.
2. be able to use information about circuits taken from data sheets and other information sources.
3. be able to use development tools for microcomputer.
4. be able to program a microcomputer system with both high-level language and assembler according to a given standard.
5. be able to build microcomputer systems for simple space applications

Contents

Computer models , memory models, buses (address , data, control), interrupt handling, interfaces and common peripheral devices in space applications, basic software engineering, machine-oriented programming in high level language and assembler, signal conditioning, simple communication protocols and other common space applications for microcomputer systems. Software development tools. Programming standards.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
Written reports on assignments and laboratory work. One report per group shall be handed in for assignments and laboratory work made in group, but all students shall contribute to the report and all parts shall be reviewed by the group members.

The laboratory work including implementation on a given hardware will give an opportunity for the student to become familiar with a common development environment and a common development system . The laboratory work includes a compulsory attendance part for demonstration of the implementation on hardware and test of the solution.

Apart from scheduled teaching the students are expected to study parts of the course literature individually and solve exercises belonging to course sections.
The student shall also study scientific and technical papers and, based on these and other relevant sources, write a report following common standard for academic writing.
The students are also expected to study and interpret data sheets and given programming standards, and to apply the standards in programming and code documentation.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.
The course is assessed through demonstration of working system for laboratory works, an individual written exam and written reports on assignment and laboratory work.

Intended learning outcome 1 is assessed through written exam and written assignment report. Intended learning outcome 2, 4 and 5 is assessed through the written exam and demonstration of working system and written reports for laboratory work. Intended learning outcome 3 is assessed through demonstration of working systems and a written reports for laboratory work.

All exams included in the module need to be completed for a course grade. Grading scale for the written exam is U 3 4 5. Grading scale for the assignment is U/G. Grading scale for laboratory work is U/G. Assignments and laboratory work render bonus marks on the written exam that follows directly after the course has been given and the following two re-exams.

Supplementation is permitted within 3 weeks after the examination by written home assignment. Completion is possible if all parts and assignments have been submitted and approved and the supplement only concerns a partial question on the written exam.

Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

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Remarks

The course can not be combined with D0013E Microcomputer engineering in an exam.

Overlap

The course D0001R is equal to D0013E

Course offered by

Department of Computer Science, Electrical and Space Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0004	Laboratory work	U G#	2.5	Mandatory	S22	
0005	Assignment report	U G#	0.5	Mandatory	S22	
0006	Written exam	G U 3 4 5	4.5	Mandatory	S22	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Robert Brännström 2023-02-15

Syllabus established

by Jonny Johansson, HUL SRT 2013-02-15

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