Micro Computer Systems

Programme course

6 credits

Mikrodatorsystem

TNE097

Valid from: 2017 Spring semester

Determined by
Board of Studies for Electrical
Engineering, Physics and Mathematics

Date determined
2017-01-25

Main field of study
Electrical Engineering

Course level
First cycle

Advancement level
G2X

Course offered for
- Electronics Design Engineering, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Basic knowledge in analog and digital electronics, basic C programming skills

Intended learning outcomes
After the course students should be able to:
- explain how microcomputers work from program in cooperation to hardware
- manage a development system to write C/C++ program and simple assembly for I/O ports, timers, A/D-converters and communication interfaces
- construct and use classes in C++
- use interrupt with different priorities to handle real time events
- use microprocessors to communicate with various sensors
- connect several processors in a system
- implement different algorithms to utilize available hardware resources

Course content
Microcontroller architecture, memory maps, I/O ports, timers, A/D-converter, communication interface and interrupt (sources and priority). Connection of different circuits such as keyboards, sensors for temperature and IR and CF-memory. Connecting processors together in a system with different buses such as serial, I2C, SPI and USB. C/C++ programming language. Classes and objects in C++. Standard Library in C++ and other program libraries. Object-oriented analysis and design of programs. Simple assembly for time critical applications.

Teaching and working methods
Education in form of lectures/lessons and laboratory work

Examination

LAB1	Laboratory work	3 credits	U, G
KTR1	On written test	3 credits	U, 3, 4, 5

Grades
Four-grade scale, LiU, U, 3, 4, 5

Department
Institutionen för teknik och naturvetenskap

Director of Studies or equivalent
Adriana Serban

Examiner
Qin-Zhong Ye

Course website and other links
http://www2.itn.liu.se/utbildning/kurs/

Education components
Preliminary scheduled hours: 52 h
Recommended self-study hours: 108 h

Course literature

Additional literature

Compendia

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.