Linnæus University

Jnr: 2015/3009-3.1.2

Course syllabus

Faculty of Technology
Department of Computer Science

1DT206 Prylar som pratar - Projektkurs i datorteknik, 7,5 högskolepoäng

Making Things Talk - project course in Computer Technology, 7.5 credits

Main field of study
Computer Engineering

Subject Group
Computer Science

Level of classification
First Level

Progression
G1N

Date of Ratification
Approved by Faculty of Technology 2015-09-24
The course syllabus is valid from spring semester 2016

Prerequisites
General entry requirements and Mathematics B or Mathematics 2a / 2b / 2c (Field-specific entry requirements 7/A7).

Objectives

After completing the course, students should be able to:

- basic circuit theory
- use formulas for calculating power, current, voltage and resistance in an electrical circuit
- describe the basic components of a computer, such as motherboard, main memory, secondary memory, input-output devices, power supplies, buses etc.
- describe different memory technologies
- describe analog / digital conversion and digital / analog conversion
- basics and principles for simple data communication
- write computer programs to the single chip computer Arduino
- adapt an existing Arduino software or programming examples for a given task
- connect components to the Arduino module and customize the software to your components
- connect Arduino module to a wireless communication module, such as ZigBee and customize a program for communication via this
- implement a project that involves the adaptation of hardware, programming and / or modification of existing software.

Content
The course comprises the following topics:

- basic circuit theory
- electricity in the home and electrical safety
- computer's various components
- data communication
- function of single chip computer
- Arduino platform
- programming of Arduino
- how Arduino and other microcontrollers can be used in larger systems
- various memory technologies for single chip and single board computers
- analog / digital conversion and digital / analog conversion
- single chip computer input and output devices
- pulse width modulation, PWM
- serial data communication, RS232
- project work

Type of Instruction
Teaching consists of lectures, laboratory sessions, project work and assignments. Main focus on laboratory sessions and project work.

Examination
The course is assessed with the grades A, B, C, D, E, Fx or F.
The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

Assessment of student performance is made through written test and/or oral examinations and/or presentation of mandatory assignments. The assessment method is decided at the start of the course.

Students who do not pass the regular examination will be offered retrials close to the regular examination.

Course Evaluation
During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

Credit Overlap
This course cannot be part of a degree in combination with another course in which the content fully or partly correspond to the content of this course: 1DT006 Making Things Talk - project course in Computer Technology, 7,.5 credits

Other
Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Required Reading and Additional Study Material
Required reading
Hur funkar det? 2013 del 1, Kjell & Company, 250 (464) pages.
Hur funkar det? 2013 del 2, Kjell & Company, 100 (approx. 400) pages.

Recommended reading

Dan O'Sullivan, Tom Igoe, *Physical Computing*, Course Technology Cengage Learning, 2004. Pages 442 (442).
Massimo Banzi, *Getting Started with Arduino*, O'Reilly, 2008. Pages 111 (111).
Tom Igoe, *Making Things Talk*, O'Reilly, 2007. Pages 60 (340).