**HALMSTAD UNIVERSITY**
Phone +46 35 16 71 00 - www.hh.se
School of Information Technology

**SYLLABUS**
-translated from Swedish
Page 1 (2)
Course Code: DT8007 / 7

# Design of Embedded and Intelligent Systems, 15 credits

Konstruktion av inbyggda och intelligenta system, 15 hp

Second level
Main field: Computer Science and Engineering A1F
Syllabus is adopted by the Research and Education Board (2015-04-01) and is valid for students admitted for the autumn semester 2015.

## Placement in the Academic System

The course is included as a compulsory course in the Master Programme in Embedded and Intelligent Systems 120 credits.

## Prerequisites and Conditions of Admission

Artificial Intelligence, 7.5 credits, Cyber-Physical Systems, 7.5 credits, Embedded Systems Programming, 7.5 credits and Engineering Mathematics 7.5 credits.

## Course Objectives

The course aims to give the student an opportunity to integrate theoretical and practical competence relevant for research and development of embedded and intelligent systems.

Following successful completion of the course the student should be able to:

*Knowledge and understanding*

- Identify and define requirements, models and system solutions and present these in reports at project delivery time points.

- Describe the importance of design trade offs, optimization and adaptation to typical embedded system requirements.

*Skills and abilities*

- Program an embedded computer implementing functions for situation and position estimation, motor control and wireless communication in a distributed system.

- Apply and use sensors and techniques for calibration, filtering and combination of signals from different sensors.

- Use skills in own specialization area in project work and cooperate with other specialists.

*Judgement and approach*

- Demonstrate a holistic view in conjunction with requirements analysis, modelling, system design and system integration.

- Take responsibility and in a constructive way contribute in an advanced development project conducted by a small work group.

- See opportunities and limitations and reason about economical, technical and scientific aspects on alternative solutions.

- Identify constraints and needs and then search for necessary knowledge to solve problems.

## Primary Contents

Methods for analysis, modelling and engineering of embedded and intelligent systems. Principles for data communication, control, as well as situation awareness by use of different sensors. Forms for and experience of work in group and in project.

## Teaching Formats

The course is organised around a development project (performed in groups of 3 students) supported by a number of laborations and some basic or complementary lectures/seminars. The project goal is to develop a system application that also gives the students an experience in using their own specific skills in cooperation with other students.

In order to solve the project, the use of lab equipment and tools of the following kind is required:

- Software development environment for embedded programming

- Support for sensor fusion and motor control

- Camera with framework enabling access to and processing of image

Teaching is in English.

**Examination**

The overall grades of Fail, 3, 4 or 5 will be awarded for the course.

Project work corresponding to 7.5 hp is examined by a written report, oral presentation and demonstration of the groups result. The full course content is examined individually in an oral examination giving 7.5 hp. The grade is based equally on project work and oral examination results.

The project work can be examined at two occasions each year, at the end of the course and approximately one month later.

**Course Evaluation**

Course evaluation is part of the course. This evaluation should offer guidance in the future development and planning of the course. Course evaluations should be documented and made available to the students.

## Course Literature

Laboratory manuals provided by the teacher and reading instructions to scientific papers relevant to each project subject area.