Mittuniversitetet
MID SWEDEN UNIVERSITY

Course Syllabus:

Electronics MA, Sensor Networks, 7.5 Credits

General data

Code	EL024A
Subject/Main field	Electronics
Cycle	Second cycle
Credits	7.50
Progressive specialisation	Second cycle, has only first-cycle course/s as entry requirements
Answerable department	Faculty of Science, Technology and Media
Established	2010-09-30
Date of change	2015-03-04
Version valid from	2013-08-15

Aim

The course aims to provide an understanding of the opportunities offered by wireless sensor networks and how they are structured in regard to hardware and routines for network communication.

Course of objectives

Upon completing the course the participant should:
- be familiar with the applications where wireless sensor networks can be used
- be able to describe what technologies are required to realize wireless sensor networks
- be able to tell what determines the capabilities and limitations of a wireless sensor units
- be able to select a network topology based on the application and performance requirements
- be able to describe the phenomenon that lead to transmission disturbances in radio channels
- be able to describe various transceiver component's energy properties
- be able to describe different types of MAC protocols for wireless sensor networks and their energy characteristics
- be able to describe some basic routing protocols and their properties
- be able to implement sensor functions of a wireless embedded system for event-driven data generation and periodic sampling of sensor data.

Content

The course covers:
- Applications suitable for wireless sensor networks and technologies necessary for hardware and software implementation
- Architectures for wireless sensor devices
- Network topologies
- Sources of wireless transmission interference
- Protocol for Multiple Access Control in wireless sensor networks
- Routing algorithms in wireless sensor networks

Entry requirements

Electrical Engineering BA (AB), 60 Credits, including digital electronics, microprocessors and analogue electronics.

Selection rules and procedures

The selectionprocess is in accordance with the Higher Education Ordinance and the local order of admission.

Teaching form

Lectures and laboratory sessions.

Examination form

4.0 credits, T102: Written exam
Grades: A, B, C, D, E, Fx and F. A-E are passed and Fx and F are failed.

2.0 credits, L102: Laboratory sessions
Grades: Pass (P) or Fail (F)

1.5 Credits, I102: Laboratory Assignment
Grades: A, B, C, D, E, Fx and F. A-E are passed and Fx and F are failed.

Grading criteria for the subject are available at www.miun.se/betygskriterier.

Grading system

The grades A, B, C, D, E, Fx and F are given on the course. On this scale the grades A through E represent pass levels, whereas Fx and F represent fail levels.

Course reading

Reference literature

Holger Karl, Andreas Willig, Protocols and Architectures for Wireless Sensor Networks, Wiley, 1st, 0-470-09510-5

Waltenegus Dargie, Christian Poellabauer, Fundamentals of Wireless Sensor Networks: Theory and Practice, Wiley, 1st, 0-470-99765-6