DALARNA UNIVERSITY

Course Syllabus

Internet of Things 7.5 Credits*, First Cycle

Learning Outcomes

After completing the education, the student should be able to:

Knowledge and Understanding

- Explain the meaning of the IoT (Internet of Things) concept, as well as opportunities and challenges for digital transformation using IoT
- Demonstrate an understanding of security aspects of IoT solutions
- Explain and show understanding of how edge, joint and cloud computing interact and complement each other in an IoT system
- Demonstrate understanding and explain how IoT solutions can be improved by choosing the right tools for data collection, analysis, processing and presentation

Skills and Abilities

- Design, model and develop IoT solutions, using appropriate programming languages for edge, fog, and cloud technologies
- Process, analyze, and present data collected through developed IoT solutions
- Write, plan, design the required documentation and present to a group

evaluation ability and approach

- Reflect and evaluate different IoT solutions from a sustainable, ethical and societal perspective

Course Content

The course focuses on some of the basic insights within IoT (Internet of Things): Why do we want to connect everything? What do we want to connect to? How do we connect everything?

The course initially contains an overview of the concept of IoT, where the effects of connecting previous, unconnected devices to the Internet, and the analysis of the data they generate, are discussed and what impact this has in industries around the world. Other key concepts that the course deals with are “automation“ and “data capture“ and how we

by breaking down large amounts of data can gain insights into, or automate, smart behaviors that can lead to optimization of everything from global energy use to improving our health and well-being. The course further deals with the technical and soft skills needed to plan, design, prototype and present, end-to-end IoT solutions. This includes concepts such as sensors, single-board computers, network connections (both wired and wireless) and the ability to program / configure these, as well as the ability to process and analyze the collected data both locally (fog computing) and in the cloud (cloud computing). Concepts such as EDA (Exploratory Data Analysis) and GIS (Geographic Information System) help in understanding how IoT solutions can be improved by choosing the right tools for data collection, analysis, processing and presentation.

Assessment
Individual oral and written presentation of assignments and group presentation at a seminar (5.5 credits)

Exam (2.0 credits)

Forms of Study
Lectures, lessons, group project work, assignments and compulsory seminar.

Grades
The Swedish grades U–VG.

Prerequisites
Scripts Programming, 7.5 credits
Software Testing 1, 7.5 credits First Cycle
Data communications 1 7,5 credits

Other Information
Replaces GMI28V

Subject:
Microdata Analysis

Group of Subjects:
Other Interdisciplinary Studies

Disciplinary Domain:
Natural Science, 100%

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This course can be included in the following main field(s) of study:
1. Information Systems
2. Microdata Analysis

Progression Indicator within (each) main field of study:
1. G1F
2. G1F

Approved:
Approved 18 February 2021
Valid from 28 April 2021