Module Description, available in: EN

Internet of Things

General Information

Number of ECTS Credits

3

Module code

TSM_IoT

Valid for academic year

2023-24

Last modification

2019-08-31

Coordinator of the module

Daniele Puccinelli (SUPSI, daniele.puccinelli@supsi.ch)

Explanations regarding the language definitions for each location:

- Instruction is given in the language defined below for each location/each time the module is held.
- Documentation is available in the languages defined below. Where documents are in several languages, the percentage distribution is shown (100% = all the documentation).
- The examination is available 100% in the languages shown for each location/each time it is held.

	Lausanne			Lugano	Zurich		
Instruction				**X** E 100%			
Documentation				**X** E 100%			
Examination				**X** E 100%			

Module Category

TSM Technical scientific module

Lessons

2 lecture periods and 1 tutorial period per week

Entry level competences

Prerequisites, previous knowledge

Familiarity with networking and TCP/IP

Basic knowledge in Python, HTML and JavaScript

Brief course description of module objectives and content

This course covers all the topics related to the Internet of Things: from the sensors level to the higher layer of data rapresentation and manipulation. It is intended to give the student the technical knowledge and skills needed for building up an Internet of Things (IoT) system.

Aims, content, methods

Learning objectives and acquired competencies

Students attending this module

- have an overview of the IoT world: the technologies, application contexts, development strategies, implementation problems, and the possible solutions
- gain familiarity with the key technologies and protocols employed at each layer of the stack
- learn how to plan and implement real-world applications that involve heterogeneous devices
- Understand where the IoT concept fits within the broader ICT industry and possible future trends
- Appreciate the role of big data, cloud computing and data analytics in a typical IoT system

Contents of module with emphasis on teaching content

Part 1 (25%):

- Introduction to the Internet of Things
- Edge and gateway devices (microcontroller, sensors, and actuators)
- Communication technologies
- Communication protocols

Part 2 (30%):

- Embedded programming (Arduino, RaspberryPi)
- Deploy an IoT infrastructure

Part 3 (30%):

- Heterogeneous IoT devices integration
- Data acquisition, management, and mining
- IoT in the real world

Part 4 (15%):

- Connect the IoT infrastructure with the data world

Teaching and learning methods

Lecture and practical work on computer and dedicated hardware

Literature

Assessment

Certification requirements

Module does not use certification requirements

Basic principle for exams

As a rule, all the standard final exams for modules and also all resit exams are to be in written form

Standard final exam for a module and written resit exam

Kind of exam

written

Duration of exam

120 minutes

Permissible aids

Aids permitted as specified below:

Permissible electronic aids

No electronic aids permitted

Other permissible aids

Slides and lecture notes in addition to recommended book chapters

Special case: Resit exam as oral exam

Kind of exam

oral

Duration of exam

30 minutes

Permissible aids

No aids permitted