

Module Description, available in: EN

Smart systems for building

General Information

Number of ECTS Credits

3

Module code

TSM_SmartSys

Valid for academic year

2022-23

Last modification

2021-01-04

Coordinator of the module

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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

Basic knowledge about building technology

Brief course description of module objectives and content

In this module, students shall become acquainted with smart systems that are already or soon to be found in buildings. Those include Building Automation and Control Systems (BACS), Smart Home, IoT-solutions, Energy Management Systems and building security. The students will get to know the purpose, functionality and applications of these systems. In addition, they will perform hands-on experiments with some of them. Also, necessary fundamentals will be addressed including system components, communication technologies and protocols.

Aims, content, methods

Learning objectives and competencies to be acquired

Learning objectives. The students shall:

- Become acquainted with smart systems for buildings. Notably Building Automation and Control Systems (BACS), Smart Home, IoT-solutions, Energy Management Systems (EMS) and building security
- Understand the purpose, functionality and applications of these systems
- Acquire the necessary fundamentals. I.e. system components, communication systems and protocols

Acquired competencies. The students shall be able to:

- Select and understand smart systems for buildings
- Devise smart systems for a given building

Module content with weighting of different components

1. **Introduction:** History of (smart) buildings, definition and structure of a smart building system, applications overview
2. **Fundamentals.** System components, communication technologies (wired and wireless), protocols
3. **Applications.** Building Automation and Control Systems, Smart Home, Internet of Things, Energy Management Systems, building security
4. **Trends.** Future trends in technologies, applications, processes
5. **Case study**

Teaching and learning methods

- 3 lecture periods per week, with blended exercise sessions and hands-on exercises (case study)
- Teaching: Frontal teaching and storytelling. Discussion of practical examples. Guided learning using lecture notes and textbooks
- Exercises: Solving practical problems under the guidance of the tutors (*coaching*)

Literature

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Assessment

Certification requirements

Module does not use certification requirements

Basic principle for exams

As a rule, all standard final exams are conducted in written form. For resit exams, lecturers will communicate the exam format (written/oral) together with the exam schedule.

Standard final exam for a module and written resit exam

Kind of exam

Written exam

Duration of exam

120 minutes

Permissible aids

Aids permitted as specified below:

Permissible electronic aids

Personal computer or tablet with internet access

Other permissible aids

Open-book: Course documentation (slides, personal notes)

Special case: Resit exam as oral exam

Kind of exam

Oral exam

Duration of exam

30 minutes

Permissible aids

Aids permitted as specified below:

Permissible electronic aids

Personal computer or tablet with internet access

Other permissible aids

Course documentation (slides, personal notes)