

**Module Description, available in: EN**

## *Smart systems for building*

**General Information****Number of ECTS Credits**

3

**Module code**

TSM\_SmartSys

**Valid for academic year**

2020-21

**Last modification**

2019-08-31

**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		
<b>Instruction</b>					X E 100%		
<b>Documentation</b>					X E 100%		
<b>Examination</b>					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 and energy

**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 Homes, IoT-solutions, Energy Management Systems (EMS) and building security. The students will get to know the purpose, applications and functionality of these systems. In addition, they will perform hands-on experiments with some of them. Finally, some common fundamentals will be addressed, including components, protocols and communication technologies for smart building systems.

## Aims, content, methods

### Learning objectives and acquired competencies

**Learning objectives.** The students shall:

- Become acquainted with smart systems for buildings, including BACS, Smart Home, EMS and building security systems
- Understand the purpose, applications and functionality of such systems
- Learn the required fundamentals, i.e. components, protocols and communication systems for smart building systems

**Acquired competencies.** The students shall be able to:

- Understand and use common smart systems for buildings
- Create concepts of smart building systems for a given building

### Contents of module with emphasis on teaching content

1. **Introduction:** History of (smart) buildings, definition and structure of a smart building, applications overview
2. **Fundamentals.** Components, protocols, communication technologies (wired and wireless)
3. **Applications.** Building Automation and Control Systems, Smart Home, Internet of Things, Energy Management Systems, building security
4. **Implementation.** Construction process & smart systems
5. **Trends.** Future trends in technology, applications, processes

### Teaching and learning methods

- 3 lecture periods per week, with integrated exercise sessions and hands-on experiments
- Teaching: Frontal teaching and storytelling. Discussion of practical cases. 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 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

- Personal computer or tablet with internet access

Other permissible aids

- Course documentation (slides, personal notes)

### Special case: Resit exam as oral exam

Kind of exam

oral

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)