

Smart systems for building

General Information

Number of ECTS Credits

3

Module code

TSM_SmartSys

Valid for academic year

2020-2021

Last modification

2019-08-31

Responsible of 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.

	Berne	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 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 repetition exams are to be in written form

Standard final exam for a module and written repetition 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: Repetition 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)