Module Description, available in: EN

Smart systems for buildings

General Information

Number of ECTS Credits

3

Module code

TSM_SmartSys

Valid for academic year

2023-24

Last modification

2022-10-03

Coordinator of the module

Olivier Steiger (HSLU, olivier.steiger@hslu.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

Basic knowledge of building technology desired

Brief course description of module objectives and content

This teaching module aims to familiarize students with smart systems that are already found or will soon be found in buildings. These include building automation and control systems (BACS), smart home, IoT solutions, energy management, and building security systems. Students will learn the purpose, functionality, and applications of these systems. They will also cover the necessary fundamentals such as system components, communication technologies and protocols.

Aims, content, methods

Learning objectives and acquired competencies

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), building security
- Understand the purpose, functionality and applications of these systems
- Learn the necessary fundamentals. I.e. components, communication technologies, protocols

Acquired competencies. The students shall be able to:

- Understand, select and conceptualize smart systems for buildings

Contents of module with emphasis on teaching content

1. **Introduction** History of smart buildings, definition and structure of a smart building system, applications overview
2. **Fundamentals** Automation of buildings, communication technologies and protocols (wired and wireless)
3. **Applications**. Building automation and control systems BACS, smart home, internet of things IoT, energy management systems EMS, building security
4. **Trends** Future trends: technologies, applications
5. **Case study**

Teaching and learning methods

- Three lecture periods per week, with mixed practice sessions and exercises
- Teaching: frontal teaching and storytelling. Discussion of real-world examples. Guided learning with the help of lecture notes and textbooks.
- Exercises: Solving practical problems under the guidance of the lecturers (*coaching*)

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

Personal computer or tablet PC with internet access

Other permissible aids

Open book: Course documentation (slides, personal notes), any other material

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

Open book: Course documentation (slides, personal notes), any other material