

**Module Description, available in: EN**

# *Heat Transfer*

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

3

**Module code**

TSM\_Heat

**Valid for academic year**

2023-24

**Last modification**

2019-09-07

**Coordinator of the module**

Heinrich Manz (HSLU, heinrich.manz@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		
<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 of thermodynamics and fluid dynamics.

**Brief course description of module objectives and content**

The basic theories of heat transfer by conduction, convection and thermal radiation are presented. However, this study-unit focuses on solving practical heat transfer problems in different fields of engineering such as architectural and HVAC engineering, mechanical and process engineering, electrical as well as environmental engineering.

## Aims, content, methods

### Learning objectives and acquired competencies

Students shall learn how to solve engineering problems in the field of heat transfer.

### Contents of module with emphasis on teaching content

- Overview of Heat Transfer Modes
- Introduction to Conduction
- One-Dimensional, Steady-State Conduction
- Two-Dimensional, Steady-State Conduction
- Transient Conduction
- Introduction to Convection
- External Flow
- Internal Flow
- Free Convection
- Introduction to Radiation
- Radiation: Processes and Properties
- Radiation: Exchange Between Surfaces

### Teaching and learning methods

Presentation of theory and practical examples of heat transfer problems, problem solving

### Literature

F. Incropera, D. DeWitt, T. L. Bergman, A. S. Lavine. Incropera's Principles of Heat and Mass Transfer: Global Edition. Wiley, 2017-11-01.

## 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

Pocket calculator

#### Other permissible aids

- Lecture notes
- Personal summary
- Course textbook (F. Incropera, D. DeWitt, T. L. Bergman, A. S. Lavine. Incropera's Principles of Heat and Mass Transfer: Global Edition. Wiley, 2017-11-01)

### Special case: Resit exam as oral exam

#### Kind of exam

oral

#### Duration of exam

30 minutes

#### Permissible aids

No aids permitted