

**Module Description, available in: EN**

## *Applied micro & nano technologies*

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

3

**Module code**

TSM\_AppMNT

**Valid for academic year**

2021-2022

**Last modification**

2021-02-12

**Coordinator of the module**

Martin Gutsche (OST, martin.gutsche@ost.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.

	Berne	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 in chemistry and physics

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

Based on selected examples this modul imparts the scientific and technological basics as well as the possibilities and the perspectives of the micro- and nanotechnologies. The students should become sensitive to the enormous potential of applications of this field and acquire a certain ability in handling it.

## Aims, content, methods

### Learning objectives and acquired competencies

- the students know the the scientific and technological basics of this technology
- the students have a general understanding of the numerous fields of the micro- and nanotechnologies and their applications
- the students are able to combine the advantages of scaling and materials with the desired functions of the device.
- based on selected nanodevices the students develop the ability to apply specific nano properties

### Contents of module with emphasis on teaching content

Introduction in the modern devcie fabrication

- scaling laws
- from photo- to nanolithography and self-assembling
- technologies for the material deposition and the surface structuring in order to result in certain electrical and other properties
- nanotools for the analysis and the modification of surfaces
- surface topography on micro- and nanolevel: AFM, SEM/TEM, IOM

Future technologies

- From MEMS to NEMS
- fullerene-based nanosystems
- biomedical applications of the nanotachnolgy
- micro- and nanofluidics
- nanosafety and risks

### Teaching and learning methods

lectures and exercises

### 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

No aids permitted

### Special case: Resit exam as oral exam

Kind of exam

oral

Duration of exam

30 minutes

Permissible aids

No aids permitted