

Module Description, available in: EN

Applied Micro & Nano Technologies

General Information

Number of ECTS Credits

3

Module code

TSM_AppMNT

Valid for academic year

2026-27

Last modification

2023-09-25

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 specified for each location and module execution.
- Documentation is available in the language(s) listed for each location and module execution. If the documentation is in multiple languages, the percentage distributed is indicated (100% = all documentation provided).
- The examination, including both questions and answers, is provided entirely (100%) in the language(s) specified for each location and module execution. The exams are on-site.

	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 in chemistry and physics

Brief course description of module objectives and content

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

Aims, content, methods

Learning objectives and competencies to be acquired

- the students know 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

Module content with weighting of different components

Introduction to modern device fabrication

- scaling laws
- from photo- to nanolithography and self-assembly
- technologies for the deposition of materials and the structuring of surfaces with the intention to realize certain electrical and other properties
- nanotools for the analysis and the modification of surfaces
- surface topography on micro- and nanolevel: AFM, SEM/TEM, IOM, FIB

Future technologies

- from MEMS to NEMS
- fullerene-based nanosystems and functional nanocomposites
- biomedical applications of nanotechnology
- micro- and nanofluidics
- nanosafety and risks

Teaching and learning methods

Lectures and exercises

Literature

Assessment

Additional performance assessment during the semester

The module does not contain an additional performance assessment during the semester

Basic principle for exams

As a rule, all standard final exams are conducted in written form. For resit exams, lecturers will communicate the exam format (written/oral) together with the exam schedule.

Standard final exam for a module and written resit exam

Kind of exam

Written exam

Duration of exam

120 minutes

Permissible aids

No aids permitted

Exception: In case of an electronic Moodle exam, adjustments to the permissible aids may occur. Lecturers will announce the final permissible aids prior to the exam session.

Special case: Resit exam as oral exam

Kind of exam

Oral exam

Duration of exam

30 minutes

Permissible aids

No aids permitted