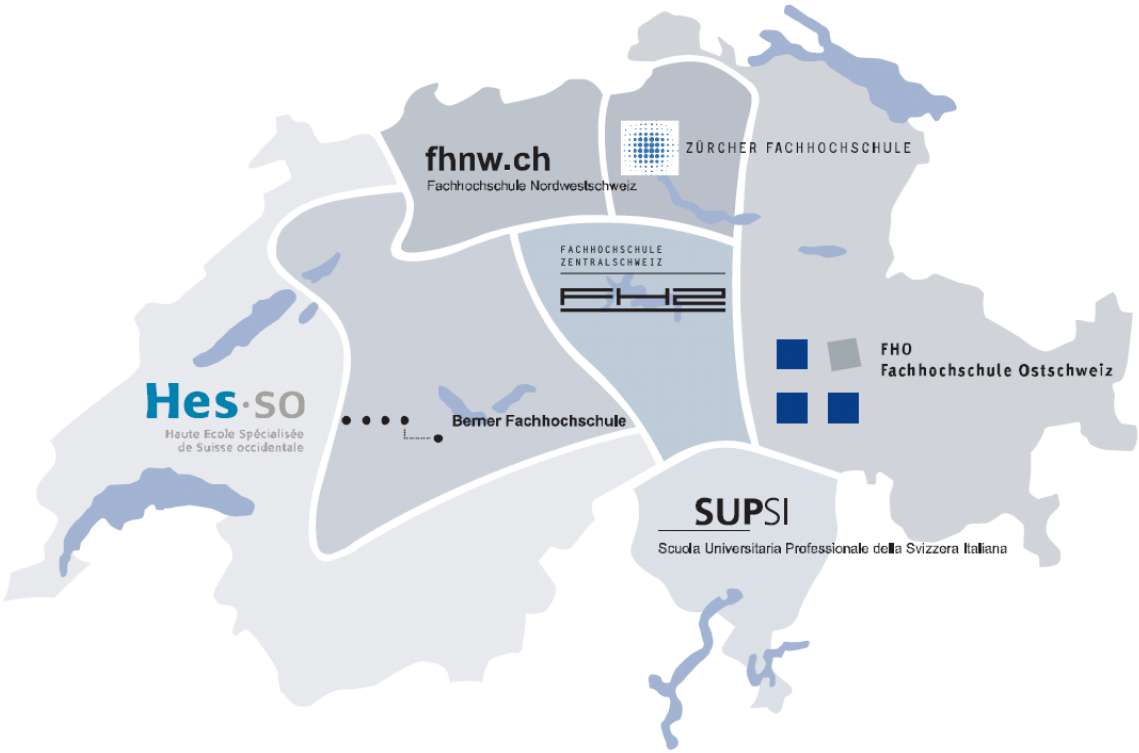
Swiss Master of Advanced Studies Nano- and Micro Technology

Federally recognized postgraduate education in Nano and Micro Technology



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1 The Master of Advanced Studies

The Master of Advanced Studies (MAS) is the only title recognized by the confederation for postgraduate studies at the master level in the natural and engineering sciences.
The Master of Advanced Studies is euro compatible.
The MAS has replaced all the unofficial master titles, which have been offered by the various educational institutions in the past. It is distinct from the Master of Science in Engineering (MSE) through its smaller number of ECTS (60 instead of 90) achieved its absence of any basic scientific training and the restricted access. It is targeted at students and professionals, who want to acquire all necessary professional skills through a shorter, but much more intensive training. This intensity is generated through small restricted classes and focus on hands-on laboratory research. The course is built on 30 individual weekly modules, each dedicated to a particular field of nanotechnology and run by top-notch scientists in this field.

2 Nanotechnology

Engineering @ nanoscale means designing, manufacturing and controlling systems and components at the level of 10^{-9} which is a $1/1000^{th}$ of a micrometer or a microsecond.
The operation of many products and industrial systems already today depends on controlling part of their components at the nanoscale: notable examples are watches, car engines, the cells of the human body, integrated circuits, information storage and communication devices, etc.
Thus, product design @ nanoscale and process engineering @ nanoscale are important steps towards realizing the manufacture, operation and reliability of those systems. It can be shown in many cases that the costs of ownership of a product can be reduced substantially by applying product design @ nanoscale and process engineering @ nanoscale.
Therefore, nanoscale devices and processes are the tools necessary to monitor and modify these systems in a focussed and economic way. The fact that so many everyday products and systems rely on control @ nanoscale ensures that nanotechnology will occupy an important part of our future engineering activities. It can be assumed, that engineering neglecting nanoscale aspects will be limited to a fraction of total engineering activities in the future.
Nanoscale engineers are now and will be increasingly in the future, seizing the opportunity to create a host of new products and services, which we can only begin to imagine.

3 Objectives of the Master of Advanced Studies in Nano- and Micro Technology program

The objective of the master program in Nano and Micro Technology is the education of nanoscale engineers from talented engineers and students who have graduated in micro technology, physics, chemistry, mechatronics, data analysis & process design, mechanical, electrical and chemical engineering.

The master course in NMT is a result of the joint effort of all the professors and lecturers of the Swiss Universities of Applied Science (UAS) specialized in the various fields of micro- and nanotechnology. To achieve this, they had created in 2002 the nanoplatform of the UAS with the objectives of

- Organizing the teaching at the postgraduate level in Nano- and Micro technology to offer the students with a bachelor degree a framework in which to acquire competence in the use of NMT-tools
- Integrating the R&D departments of the private sector into the postgraduate education at the UAS.

The master course in NMT is a novel and innovative form of training. and should prepare you for your future job as

- Nanoscale and micro technology engineers
  - Innovating product design
  - Innovating manufacturing processes
- Engineers transforming research results into innovative products

You will also benefit from the fact that the nanoplatform is

- In partnership with industry, serving in particular the R & D needs of SMEs. The program can offer ½-time jobs in various locations compatible with the curriculum.
- A vehicle for the integration of the Swiss community of applied R & D in the field of NMT into the **E**uropean **R**esearch **A**rea (ERA). This will be used to assure not only euro compatibility, but also to organize exchange programs with the objective to participate in the training of nanoscale euro-engineers, a goal pursued currently by different European educational institutions.

The proposed master course in Nano- and Micro Technology will provide you with:

- An in-depth understanding of nanoscale phenomena
- Skills in modifying and monitoring components @ nanoscale
- Skills in solving packaging problems and in using system integration technology
- The multidisciplinary know-how in informatics, physics, biology, material science that is now essential for success in engineering @ nanoscale

The graduates of this program are able to understand and use the tools and equipment of current nanotechnology. Particular emphasis is put on hands-on experience. The participation in the courses of other Swiss institutions with internationally recognized experience in nanotechnology will give you the opportunity

to acquaint yourself with a broad spectrum of equipment and R & D possibilities in the field of nanotechnology. This is made possible, by the distribution of the classes all over Switzerland.
Introducing you to the national industrial and research capabilities and enhancing your intercultural capability are additional benefits of a nation wide education.

The master course is built from 28 weekly courses, which take place at the following sites: Buchs, Le Locle, Basel, Manno, Winterthur, Burgdorf, Aarau, Yverdon, Dübendorf, Rapperswil, Olten and Geneva. They have been chosen for the availability of the necessary equipment.

About 1/3 of the participants in these courses are engineers from industry who want to acquire particular skills or competencies. This cooperation with peers who are active in their profession, gives you an additional important training opportunity, and provides you with a sizable network of professional relations at the end of the course.

4 Conditions for admission

Participation is limited to engineers and scientists

4.1 Graduated in one of the following disciplines: micro technology, physics, chemistry, biology, mechatronics, data & process design, mechanical engineering, electrical engineering, systems engineering, chemistry, life sciences, physics, materials science or associated disciplines
Required level: Bachelor, diploma EPF, UAS or equivalent (bac + 3+),

4.2 Accepted by the research team cooperating in the master's thesis

4.3 Accepting the contractual conditions of the master's thesis work with respect to confidentiality and ownership of industrial property.

For more information please contact the responsible persons.
Students which do not have a valid permit for staying in Switzerland will receive a provisional registration, which they can use for applying for a permit from the swiss authorities.

5 Educational Program

5.1 Forms of participation

The whole program is completely modular. In principle you can earn your master degree over any period of time by following weekly courses and enlisting for a master thesis at the end. The expiration date for any ECTSs granted in this program is 6 years. Indeed an increasing number of students are using the program in phases of reorientation of their career and life.
The masters program corresponds to the equivalent of one full year of studies and will earn 60 ECTS points. It requires successful validation of 20 weekly courses or seminars corresponding to 40 ECTS points and successful defence of a diploma thesis earning you an additional 20 ECTS points. You can choose from a total of 30 courses offered. The courses are offered on a bi-annual basis (see past and current programs).
There is no "academic" year. You can enter the program any time with any of the 30 courses. They are independent. (Their content is harmonized and complimentary). You graduate once you have collected the required 60 ECTS points. The program committee can recognize ECTS points from courses taught outside the program. You can choose and vary the intensity of your training throughout your studies. T. It is open for
Students employed in industry can do their thesis work on the premises of their employers under the supervision of the professor of the program.

5.2 Practical Organisation

Your stay at the various locations will be organized by a local committee, which will provide you with the following services.

- Joint low cost lodging for all the participants choosing this option
- Assistance in reservation of individual hotels
- Joint on site lunches and dinners for all the participants choosing this option

Note, that the costs for lodging and meals are not included in the fees.
The fees do include:

- Full set of booklets of all the courses of the program, including those, you have chosen not to attend.
- Refreshments during the breaks
- Office space at the university, where you can do your homework and discuss with your colleagues. The space will have the entire infrastructure necessary including internet access through the university server.
- Library service
- Literature retrieving services

All other services offered to its students by the hosting university.

5.3 Language

All courses, scripts and examinations are in English. According to oour experience even students with poor English skills can follow the courses and will be fluent in technical English when graduating

6 Validation: examinations and approval of the master's thesis

The validation consists of 4 elements:

- Each weekly course ends with a written or oral examination. It will be marked from A to E. Only courses, where the examination has been passed successfully are applicable for the admission to the final exam and the master thesis. Each examination earns an individual certificate worth 2 ECTS points. The certificate remains valid, even, if you do not complete the full program. Only certificates marked D or higher are taken into account for the degree. (see regulation for details)
- Each seminar will be evaluated by at least 2 experts (see regulations for details).
  The number of seminars that can be credited for your degree is 5. One seminar is mandatory.
- The diploma thesis will be evaluated by 2 experts and also be marked from A to E
- A defence of the diploma work in front of a jury of at least 5 experts comprising the 2 experts that have evaluated the thesis. The defence can be public or confidential – if the content of the thesis is confidential.

An accepted thesis and a successful defence earn you 20 ECTS.
Thesis work can be started before all courses have been passed.

Only students, who have successfully accomplished all 4 elements of validation can claim the title of Master of Advanced Studies in Nano- and Micro technology.

7 Conclusion and title

Students, who have successfully accomplished all 4 elements of validation, can claim completion of the federally recognized postgraduate master course in Nano- and Micro technology.
Students, who will have successfully concluded the master course, are authorized to carry the title

Master of Advanced Studies in Nano- and Micro Technology, University of Applied Science of Switzerland, Nano- and Microtechnology;
MAS, UAS-CH, NMT

Currently this title can only be given by the University of Applied Science of Western Switzerland. Master of Advanced Studies is the official federal title for postgraduate masters. It is protected by federal law.

8 Registration

You can contact any UAS participating in the program for participation. The list of contact persons is given under contacts. The contact person or the program director will evaluate your eligibility and discuss your research interest with you, in order to direct you to the team most appropriate for your master's thesis.
Registration will be handled by the UASWS Geneva. The secretariat is at the Geneva School of Engineering, Mrs Buchs. If you feel, that you satisfy the conditions for admission, just send a completed application form with copies of all required documents to the secretariat in Geneva. Once your application has been cleared, you will receive a provisional confirmation of registration. Definite registration is contingent on the receipt of the first down payment and a document certifying your permission to stay in Switzerland.

9 Fees and conditions of payment

9.1 Fees

Master course: **12 000 Swiss Francs**

Postgraduate short course: **2 000 Swiss Francs**

Local housing (optional): about 250-400 CHF per week of course

9.2 Conditions of payment

In signing the registration form, the student agrees with the terms and contracts the obligation to pay the integrality of the fees according to the following schedule:
Registration fee SF 2000.-
Further instalments according to progress in the studies.

Students with backward dues can be excluded from the courses.