

# Master of Science

## Micro and Nanotechnologies for Integrated Systems

In partnership with Politecnico di Torino, Ecole Polytechnique Fédérale Lausanne (EPFL)

<http://www.master-nanotech.com>

### ✓ Duration

Year 1 : Course work from September to June followed by a 3 month internship  
Year 2: Course work from September to January then 6 month final Internship

### ✓ Start date

September

### ✓ Tuition Fees

[www.grenoble-inp.fr/admissions](http://www.grenoble-inp.fr/admissions)

### ✓ International students

Welcome package

### ✓ Admission Criteria

Bachelor of Science in Physics or Electronics or Bachelor of Engineering or the equivalent thereof

English proficiency

Excellent academic results

### ✓ Application deadline

April 30th

### Program Contact:

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Microelectronic products, omnipresent in our daily lives, can still undergo even more sophisticated miniaturisation. This science of creating, designing, integrating and manufacturing miniature components, instruments and systems is carried out using expertise in micrometric and nanometric technology. This is a multidisciplinary domain where electronic and mechanical elements are integrated together with information technology, chemical and optical elements

## Learning outcome

The objective of this degree course is to train engineers with a wide range of knowledge in this field, where applications abound in practically all sectors of the world economy.

## Benefits

Ability to develop diagnostic techniques and to solve complex problems by selecting and mobilizing the best analytical, numerical or experimental tools.

Capacities to work in a team in a complex international and multicultural environment with colleagues from different cultures.

Aptitude to lead and manage group cross-disciplinary group projects, research or industrial projects in an international context.

Capacity to develop innovation, to explore breakthrough technologies and to implement them taking into account environmental, societal and human constraints and/or region.

Micro and nanotechnologies are rapidly expanding fields of industry, destined for significant developments in the coming years.

As this concerns the field of high technology, European industry, in competition with the more advanced, in this area, American and Japanese industries, needs, and will need specialized engineers and researchers, who have a solid foundation training which will allow them to adapt to rapid developments in these fields.

The graduates from Master Nanotech are trained to match these needs.

## Career opportunities

- Electronics, microelectronics
- Computer sciences
- Telecommunications
- Material engineering
- Microsystems-Microtechnology
- Biotechnology
- Food industry
- Car industry
- Finance
- Aerospace
- Strategy consulting
- Advanced technologies management

## Program content\*

Period	Courses	ECTS
<b>Year 1</b> Politecnico di Torino, Italy September-January	Microtechnologies and microsystems Solid State Physics and electronic devices Materials for Microsystems and characterization of technological processes Design and modeling microsystems	30
<b>Year 1</b> Grenoble Institute of Technology, France February-May	Physics of Nanostructures From micro to nanoelectronics Nanostructures for optical and magnetic applications Advanced Microscopy and advanced lithography Biotechnologies Analogue and digital circuits design Optical integrated circuits Micro and Nanotechnologies Labs	30
June – July (minimum 10 weeks)	Research project or internship	4
<b>Year 2</b> Swiss Federal Institute of Technology, EPFL Switzerland September-February	Nanoelectronics Optoelectronics Physical models for micro and nanosystems Analogue circuit design High Frequency Electronic circuits Hardware systems modeling	26
<b>Year 2</b> March-August (minimum 5 weeks)	Master thesis in an industrial firm or research laboratory in France, or abroad	30
<b>Total</b>		<b>120</b>

ECTS European Credits Transfer System

\*May be modified

## School environment

The first semester will be at Politecnico di Torino, Italy's oldest Technical university. It offers top ranking educational programs in Engineering and architecture. It interacts with the local, social and economic context, as well as with companies and research centers from all over the world.

The second semester will be at the Grenoble Institute of Technology, where research, education and industry meet. Set in a rich industrial and research-intensive environment, the campus is the ideal place for highly motivated students with a strong career oriented interest.

The third semester is at the Lausanne Swiss Federal Institute of Technology (EPFL) a high-tech institution with a reputation for basic research, as well as for its contribution to the great scientific and environmental adventures of tomorrow.

## Master thesis

Each student will be required to complete an internship either at an industrial firm or in a research laboratory. This may be undertaken in France or abroad. This is an opportunity to consolidate and discover working methods and to learn how to manage real projects. A written dissertation will be required at the end of the training period to be defended in front of a jury.

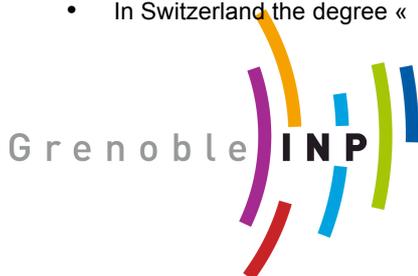
Possible research laboratories and companies

CEA-Leti, IMT-NE, CSEM, Olivetti, EM-Marin, Tronics, IBM, SOITEC, ST, ...

## Degree awarded

The degree course students will receive a double degree : the « Master's Degree in Micro and Nanotechnologies for Integrated Systems » from Grenoble INP, the Politecnico di Torino, and the EPF Lausanne, granted and signed jointly by the three institutions, and

- In France the « Diplôme d'ingénieur en micro and nanotechnologies pour systèmes intégrés ».
- In Italy the degree "Laurea Specialistica Micro e Nanotecnologie per System Integrati".
- In Switzerland the degree « Master en Micro et nanotechnologies pour systèmes intégrés ».



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