



✓ **Duration**

Year 1 : Courses from September to June
Then 3 month internship
Year 2: Courses from September to January
then 6 month final internship

✓ **Starting date**

September 2012

✓ **Tuition Fees**

www.grenoble-inp.fr

✓ **International students**

Welcome package

✓ **Admission Criteria**

Bachelor of Physics and Electronics or
Bachelor of Engineering or the equivalent thereof

English proficiency

Excellent academic results

✓ **To apply**

Application form online at
www.master-nanotech.com

✓ **Application deadline**

May 15th

Program Contact:

www.master-nanotech.com

Master

Micro and nanotechnologies for integrated systems

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 the micrometric and nanometric technology. This is a multidisciplinary field where electronic and mechanical elements are integrated together with information technology, chemical or 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.

Competences

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

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

Aptitude to lead and manage 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.

Career opportunities

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

Program content*

Period	Program summary	ECTS
Year 1 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
Year 1 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 - September	Research project in a laboratory	
Year 2 Swiss Federal Institute of Technology, Switzerland September - February	Nanoelectronics Optoelectronics Physical models for micro and nanosystems Analogue circuit design High Frequency Electronic circuits Hardware systems modeling	30
Year 2 Mars-August	Master thesis in an industrial firm or research laboratory in France or abroad	30

ECTS European Credits Transfer System

* May be modified

School environment

The first semester takes place at the 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 MINATEC - 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 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 in an industrial center or in a research laboratory in France or abroad. This is an opportunity to consolidate and discover new working methods and to learn how to manage real projects. A written report will be required at the end of the training period to be defended in front of a jury.

Possible research laboratories:

MIT, UCLA, CALTECH, Columbia university, Berkeley university, Harvard, Boston university, CEA-Leti, IMEP-LAHC, IMT-NE, CSEM, ETH, CERN, Tyndal, Pekin university, Tokyo university, Twente university, Montreal university, Waterloo university, McGill university ...

Companies:

IBM, Xerox, Sensor Dynamics, Debiotech, Leptomix, Biocaptis, Sony, Alcatel, NXP, Philips, Qimonda, Olivetti, EM-Marin, Tronics, SOITEC, ST, ...



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