Welcome to
MINES Saint-Étienne !

MINES
Saint-Étienne

Une école de l'IMT

Aix*Marseille université

Hybrid Electronics

Master of Science in Nanosciences and Nanotechnologies

www.mines-stetienne.fr

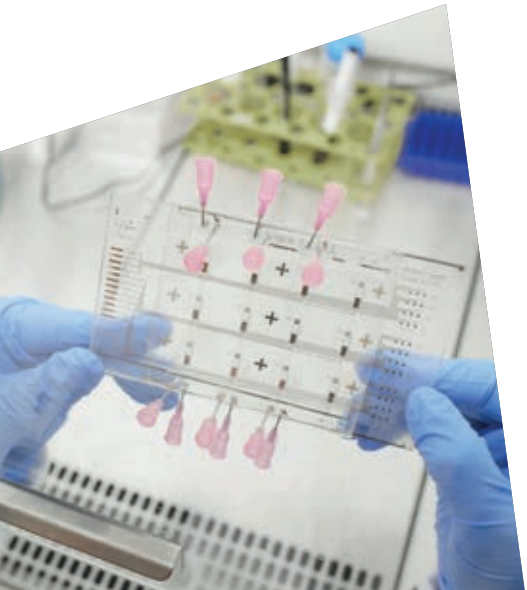
INSPIRING
INNOVATION
SINCE 1816

« Shape the future of materials with us ! »

A Master of Science (National Master's Degree)
Accredited by the French Ministry of Higher Education and Research
at the ***École Nationale Supérieure des Mines de Saint-Étienne****, France*
Cohabilited with ***Aix-Marseille Université***

Taught in English

Follow a one-year Master's programme in Hybrid Electronics that hosts world-renowned Professors and Research Scientists heading research laboratories in the field of Nanotechnology and Materials Science (University of California San Diego, University of Pisa, Technion-Israël Instute of Technology, University of Western Ontario,...).



Course Structure

The course is designed to provide an education programme extending from the fabrication of nanomaterials to the design of communicating autonomous systems for modern microelectronics (Internet of Things, wearable technologies, biomedical devices, etc...). These systems incorporate sensors, actuators, energy and its management system, signal processing as well as their wireless transmission. A specific focus on bioelectronics, a rapidly emerging discipline aiming at interfacing the human body with "classical electronics" is also addressed.

- Microelectronics Design
- Electronic & Energy
- BioMedical Devices
- Molecular electronics
- Micro-generators
- Stretchable electronics
- Micro-fabrication processes
- Sensors
- Organic optoelectronics
- Biolectronic & Biomimetism
- 4-6 month Research internship

PhD Opportunities

possibilities of joint supervision PhD with our foreign partners

- Design and conception of flexible/ stretchable microbatteries
- Smart interfaces (Smart Tags, Touchpad RF, ...)
- Bio-robotic (e-skin) and smart textile based on stretchable electronics
- Stretchable organic electrochemical transistors

Job Opportunities

Graduates of this interdisciplinary Master of Science programme may apply for academic or industrial positions as engineers or researchers in wearable technologies, Internet of Things, electronic textiles, bioelectronics devices, plastronics,...

Internship Opportunities

- Nanomaterials (ink fabrication, deposition / patterning, characterization)
- Stretchable / conformable electronics (various substrates, printing electronics, packaging ic)
- Micropower sources (solid state/ flexible batteries, energy harvesting, thermo and triboelectricity)

Requirements for applicants

- Successful completion of a first year of a Master's Degree in microelectronics and / or Materials science, or equivalent diploma /or 240 ECTS validated (MINES Saint-Etienne)
- A good command of English is mandatory

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With the collaboration of the Education and Research Centre for Microelectronics in Provence (CMP)

Fields of expertise
- Pioneering microelectronics for applications in flexible electronics
- Bioelectronics and logistics
- Designing, prototyping and secure characterization of circuits

Topics
- Optimization and operational research in industrial engineering
- Hardware security (smartcard)
- Inkjet printing on flexible substrates for connected objects
- Interfacing between life sciences and organic electronics

International Research Units
UCSD, Technion, Univ. Pisa ...

Facilities and specific platforms
- CIMPACA-MicroPackS Platform: Partnership between business and academic world
- Clean rooms, security and bioelectronics labs
- ID-FAB prototyping platform : #IOT project of Mines Saint Etienne Tech programme

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