

## **Micro and Nanofabrication techniques at AIME -**

### **Training for future technicians, engineers.**

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#### **1. SUMMARY:**

The training of future engineers in the micro and nanotechnology fields is an extremely difficult challenge. Originally, microelectronics required basic knowledge of solid physics and Si-based semiconductors, as well as integrated circuit electronics. During the last 10 years, microelectronics has diversified considerably (nanoscale components, alternative manufacturing techniques, flexible substrate electronics, communicating and autonomous objects, applications to biology and medicine, etc...) . The teaching faces the great diversity of concepts (from quantum physics to circuit electronics), the use of many CAD software, sharp and expensive.

In the INSA campus in Toulouse, the regional pole of the GIP CNFM, is a platform equipped with CAD means with professional software and micro / nanofabrication in clean room. We offer a wide range of training based on practice. They aim to provide students with a sense of being, a know-how, and according to the training objectives, an experimental culture of micro-nanofabrication in Si technology, interdisciplinarity, alternative processes, etc ... Rapid prototyping by laser photolithography allow to set up active learning project-based learning, where the student designs and manufactures integrated circuits in Si technology to meet a personalized specifications.

Different topics are addressed :

- Microfluidics,
- Fabrication and test integrated components in Si technology (diode, transistor).
- Photo-detectors in Si technology.
- Fabrication and test of chemical sensors, which sensitive area is made of WO<sub>3</sub> nanowire elaborated by colloidal chemistry.
- MEMS.
- Micro-supercondensators.
- e-beam lithography.

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