

**MICROSYSTÈMES, MICROCAPTEURS, MICROFLUIDIQUE****MICROSYSTEMS, MICROSENSORS, MICROFLUIDIC****Lecturers:** Emmanuelle LAURENCEAU, Ian O CONNOR

| Lecturers : 16.0 | TC : 0.0 | PW : 0.0 | Autonomy : 0.0 | Study : 12.0 | Project : 0.0 | Language : FR

Objectives

Starting from the example of a lab-on-chip for biological analysis, the issues related to the integration of different components and functions on a miniaturized system will be developed and clarified. An introduction to microfluidics (physics at the microfluidic scale, influence of the laws of scale on the miniaturization of systems, hydrodynamics of microfluidic systems, diffusion, mixing and separation in microsystems) as well as the notions necessary for understanding the problems of Acquisition of the very low amplitude signal will be presented. The cases of chemical and biological sensors will be particularly developed.

Keywords : Miniaturized system, sensor and biosensor, integration, microfluidics**Programme**

Chemical, biological and physical microsensors
Electrokinetics, diffusion and mixing in microsystems
Electronic detection, noise level, electronic control of sample movement
BE1: Bibliographic study of a biosensor
BE2: Microfluidics
BE3: Electronic signal processing

Learning outcomes

- Know the basics of how a microsensor works
- Know how to develop a microsystem for a given application
- Extract data
- Analyze a scientific publication

Independent study**Objectifs :** This activity is not concerned with framed autonomy activities outside personal work.**Méthodes :** This activity is not concerned with framed autonomy activities outside personal work.**Core texts**

Cooper Jonathan M., *BIOSENSORS*, Oxford University Press, 2004
Folch Albert *INTRODUCTION TO BIOMEMS*, CRC Press, 2013
Tabeling Patrick *INTRODUCTION À LA MICROFLUIDIQUE*, Belin, 2003

Assessment

Final mark= 33% mark BE1 + 33% mark BE2 + 33% mark BE3