

Biomedical microsystems

Number of ECTS credits: 3

Coefficient: 3

Description:

Introduction to microfluidics and the laws governing small-scale liquid flows. Use of these laws to understand the design of lab-on-chip

Analysis of implantable or non-implantable biomedical devices Lab1: Numerical study of flows in microchannels (COMSOL) Lab2: Metrology of a microdevice for biological analyzes

Pedagogical objectives:

Know how to apply the laws that govern the behavior of fluids on a small scale. Know how to dimension a microfluidic circuit

Know the principles and manufacturing technologies of the elements present in a lab on chip

Know how to design piezoresistive or acoustic devices for biological or biomedical surveillance applications

Understand the transducer and electronics of an implant

Bibliography: Prerequisite:

Basics of COMSOL multiphysics software, concepts of microfabrication, physical principle of transducers, properties of materials, tensors

Lectures Hours: 15

Tutorials Hours: 9.5

Labs Hours: 4

Knowledge monitoring modalities: 100% continuous assesement

Assesement: 1 mini-project, reports of labs, exam

Leader: Franck CHOLLET

Participants: Thérèse LEBLOIS, Céline ELIE-CAILLE