



Micromechatronics

Number of ECTS credits: 3

Coefficient: 3

Description:

- Introduction, scale effects on the main physical phenomena and their models
- Study and modeling of compliant systems
- Presentation of the panel of the main operating modes used on the micrometric scale. The principles of capacitive and thermal actuation will be more particularly studied and modeled
- Design methodology of Micromechatronics systems (MEMS point of view complementary to the microRobotics approach / task planned in M2)
- Study of the main micro-manufacturing solutions outside the clean room: laser, rapid prototyping, chip removal, EDM, molding, powder metallurgy, ultra-sound
- Examples of Micromechatronic systems

Pedagogical objectives:

- Understand and model the behavior of a Micromechatronics system taking into account the specificities of scale, more specifically for electrostatic and thermal systems
- Choose a manufacturing process adapted to the realization of micro-components and systems
- Proposing and justifying a choice of microactuator and of a compliant structure to perform a function (eg grasping) according to a specification

Bibliography: Prerequisite:

Basic knowledge of physics and automated systems

Lectures Hours: 13.5

Tutorials Hours: 6

Labs Hours: 9

Knowledge monitoring modalities: 100% continuous assesement

Assesement: Exams, lab reports

Leader: Philippe LUTZ

Participants: Cédric CLEVY, Joel AGNUS