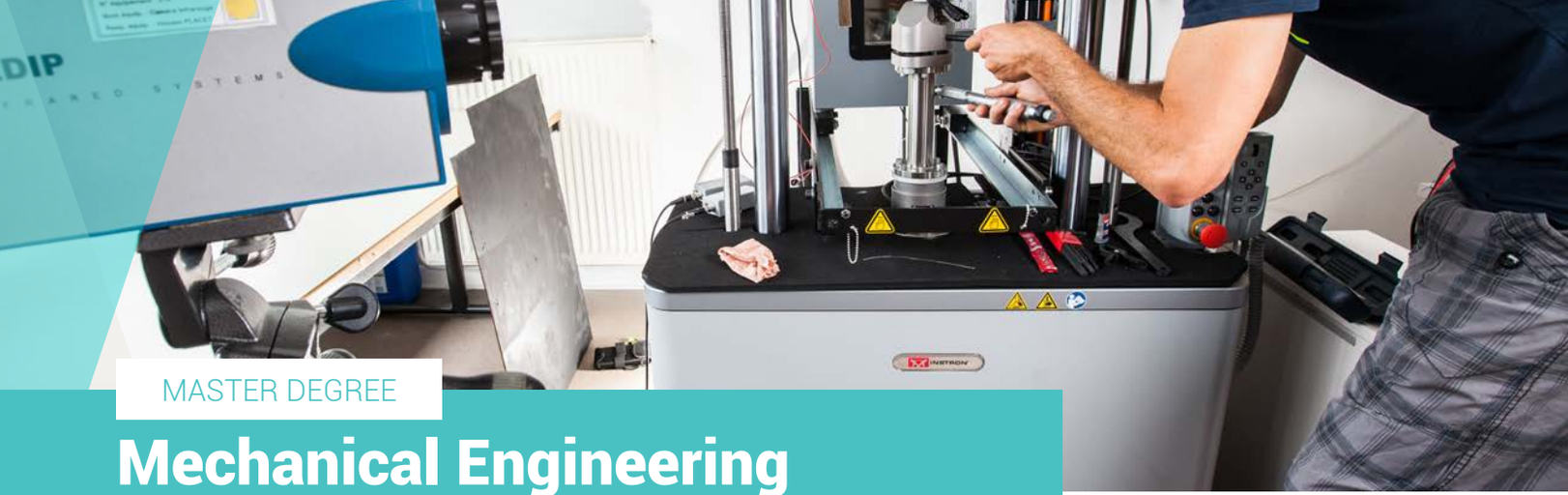


MASTER DEGREE

Mechanical Engineering
SMART MECHANICS

SMART MECHANICS Master Degree Presentation

Smart Mechanics MSc provides skills for the design of innovative solutions for applications such as vibroacoustic control (NVH), Structural Heath Monitoring (SHM), Shape Control, or Energy Harvesting for instance. Different strategies can be developed to add such new functionalities to structures as the design of geometrically architected technologies, the integration of smart materials with multiphysic behaviors, or the development of embedded sensors and actuators with their controllers. The program is inspired by these emerging technologies and opens ways to careers in industry consulting and research. The best students will have the opportunity to obtain a scholarship to prepare a doctoral thesis.

This graduate program will make you develop skills in design, modeling, numerical simulation and experiments in the fields of mechanical engineering. As such solutions are likely to involve many physical phenomena (acoustics, heat transfer, electro-magnetics) coupled to mechanical applications, the specialization includes methodologies for mechanical and multiphysics modeling with advanced mathematical, numerical and experimental tools.

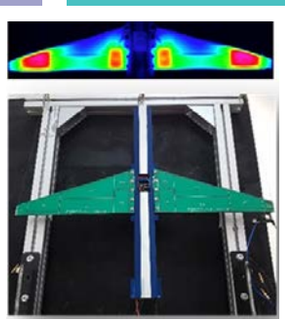
PROGRAM (Besançon Campus)

YEAR 1

Core Courses with Research Project 24 ECTS		Crossdisciplinary Courses 6 ECTS
Core Courses with Research Project 18 ECTS	Soft Skills Courses 6 ECTS	Crossdisciplinary Courses 6 ECTS

YEAR 2

Specialized Courses with Research Project 24 ECTS	Soft Skills Courses 6 ECTS
Research Internship 30 ECTS	



Core Course List: 42 ECTS

- ADVANCED COMPUTATIONAL METHODS
- CONTINUUM MECHANICS
- MODELING & SIMULATION
- EXPERIMENTAL METHODS
- RESEARCH PROJECT
- RESEARCH INTERNSHIP

Cross-disciplinary Course List: 12 ECTS

- VERIFICATION & VALIDATION
- OPTIMIZATION
- NUMERICAL MODELLING FOR MULTIPLE PHYSICS
- OPTIMAL AND ROBUST DESIGN BASED ON VALIDATED MODELS

Specialized Course List: 24 ECTS

- SMART MATERIALS
- SMART STRUCTURES
- MULTIPHYSIC MODELLING & SIMULATION
- STRUCTURAL DYNAMICS & VIBROACOUSTICS
- MICROMECHANICAL SYSTEMS DESIGN
- ROBUST DESIGN
- NON LINEAR MECHANICS FOR SMART APPLICATIONS
- ADVANCED RESEARCH PROJECT

Soft Skills Course List: 12 ECTS

- FOREIGN LANGUAGE
- SCIENTIFIC CULTURE
- COMMUNICATION
- PROJECT MANAGEMENT

Contact :
master-smartmechanics@univ-fcomte.fr

EIPHI-BFC GRADUATE SCHOOL CROSS DISCIPLINARY SCIENCE AND TECHNOLOGY

INVESTIR L'AVENIR

UBFC UNIVERSITÉ BOURGOGNE FRANCHE-COMTÉ

UNIVERSITÉ DE FRANCHE-COMTÉ

ensmm École Nationale Supérieure de Mécanique et des Microtechniques

RESEARCH

APPLIED MECHANICS DEPARTMENT

MATERIALS, SURFACES, PROCESSES & STRUCTURES

2 Research Fields

Micromechanics: materials and processes

Pushing back the limits of the small scale:

- Precision mechanics (watch making industries)
- Microfabrication processes
- Micrometric devices
- Thin-film scale effects
- Micro-texturing, etc.

Activities situated at the interface between nanotechnologies (MIMENTO technology platform) and the visible macroscopic world (MIFHySTO platform).

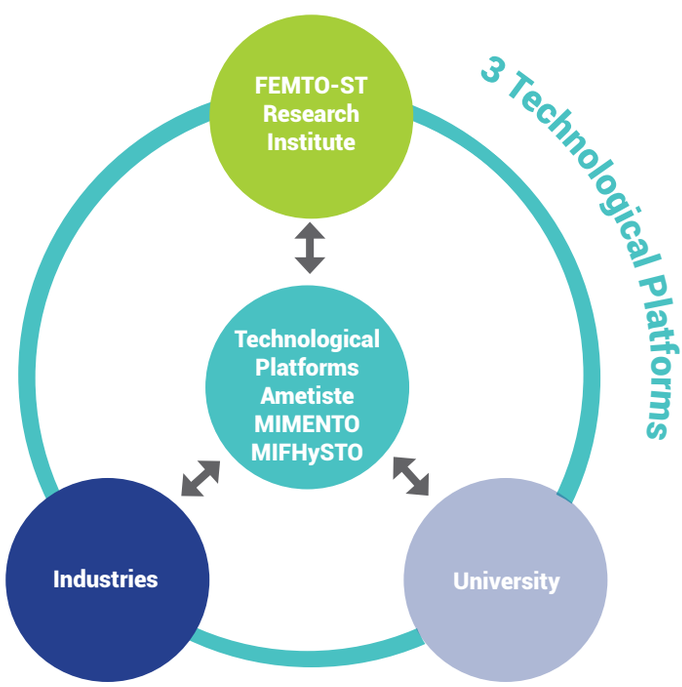
Structures: integration and functionalization

Developing new structures able to adapt, interact and take advantage of its environment:

- New composite materials (bio-based …)
- Integrated transducers networks
- Matter Embedded Energy Harvesters
- Materials & structures for vibroacoustic applications
- Micro-actuators networks for noise control

Experimental activities are supported by the Ametiste Platform.

The Smart Mechanics MSc is associated to the Department of Applied Mechanics of FEMTO-ST Institute. One specialization of the departement is the integration and functionalization of structures. Students work in the laboratory for their research projects, teaching activities, and do their internship there.



EIPHI-BFC GRADUATE SCHOOL CROSS DISCIPLINARY SCIENCE AND TECHNOLOGY

femto-st SCIENCES & TECHNOLOGIES

Concetpion: UBFC, Credits: Ludovic Godard, UFC (September 2018)