SHAKE THE FUTURE.

CENTRALE NANTES



Master

Mechanical Engineering

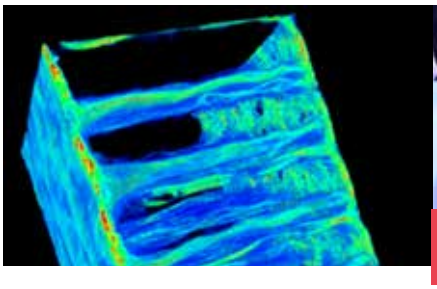
Graduate programme | Master in Sciences, Technologies and Health

ADVANCED COMPOSITE ENGINEERING AND SCIENCE

OBJECTIVES

This Master programme develops skills for providing innovative and optimized solutions in the design and manufacturing of composite materials for research and in industry.

The performance of fibre-reinforced organic-matrix composites and structures are influenced by the constituting materials and the processing stage. Composite mechanical design can be efficiently and optimally performed when one has a good understanding of the manufacturing's influences and constraints. Therefores the curriculum offered in this programme will provide a theoretical and experimental emphasis on the relationships between constituents, processing and structural design.







SKILLS

Specialism-specific

- Simulate and optimize composite mechanical design and manufacturing using numerical tools
- Model materials' behaviour and physics involved in composite processes
- Characterize and manufacture composite materials

General

- Identify models, perform simulation and analyse results
- Communicate comprehensive results in a meaningful way
- Undertake bibliographic surveys from international research and professional literature
- Manage or be part of a project

JOB PROSPECTS & FURTHER PHD STUDIES

SECTOR: Aeronautics, Automotive, Transportation, Wind and Marine Energy, Materials producer, Consulting.

FIELDS: Mechanical Engineering, Design, Materials, Advanced Processes, Manufacturing, Research and Innovation.

JOB POSITIONS: Mechanical Engineer, Process Engineer, Design Engineer, Research and Innovation Engineer (post PhD), Consultant.



Location
Nantes, France -2 hours from Paris

International campus life

87 nationalities

43% international students

Master in Sciences, Technologies and Health

EXAMPLES OF FINAL YEAR PROJECTS

5 to 6 month internship in Industry

> Product design of a composite motorcyclist protection
> Sol-gel functionalization by nano-particle entrapping: a formulation for transparency
> Edge sealing and release agent optimization for aeronautic composite processes

5 to 6 month thesis in Research Labs

> Composite design with multi-objective optimisation
> In-situ compression of carbon-fibre reinforcements in X-Ray tomography
> Modelling and characterization of thin films piezoelectric materials

FACULTY, INDUSTRIAL PARTNERS AND RESEARCH LABS

This Master relies on the Centrale Nantes' faculty, staff and research facilities of the GeM Institute, the LHEEA Laboratory and the LS2N Institute. Centrale Nantes has several industrial partnerships such as with Airbus, Renault, Faurecia, Solvay, IFREMER, CETIM.

OTHER PROGRAMME INFORMATION

> Length of Studies: 2 years
> Language of instruction: English
> 3 semesters of courses and 1 semester of Master's thesis

Tuition & Fees - Scholarships - Application process - Deadlines

MORE INFORMATION AND FULL PROGRAMME:
www.ec-nantes.fr/masters

CONTACT: Ms Sarah Alami
master.admission@ec-nantes.fr

CONTENT AND COURSES

(A Master Degree requires the validation of 120 ECTS credits)

M1 - AUTUMN SEMESTER	ECTS
Continuum Mechanics	5
Fluid Mechanics	5
Programming and Algorithm	4
Numerical Methods	4
Vibrations and Differential Equations	4
Business Environment	4
Modern Languages	4
M1 - SPRING SEMESTER	**ECTS**
Engineering Materials	5
Constitutive Laws	5
Structural Mechanics	5
Computer-aided Design	5
Mechanical Design	4
Conferences and Initiation to Research	2
Modern Languages	4
M2 - AUTUMN SEMESTER	**ECTS**
Composite Constituents and Processes	3
Composites Characterization	4
Composites Processing Modelling	3
Composite Structures	4
Manufacturing System Organization	4
Multi-Physics Modelling for Processes	4
Modern Languages	4
Project	4
Conferences	-
M2 - SPRING SEMESTER	**ECTS**
Master Thesis or Industrial Internship	30

NB Course content may be subject to minor changes

Ecole Centrale de Nantes. Direction de la communication. July 2019

This Master's programme is accredited by French Ministry of Higher Education.

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