Master of Science and Technology in Complex Systems Engineering

BIOMEDICAL ENGINEERING

FULLY TAUGHT IN ENGLISH
STATE ACCREDITED PROGRAMME

Centrale Méditerranée

MASTER OF SCIENCE AND TECHNOLOGY IN "COMPLEX SYSTEMS ENGINEERING"

A "complex system" can be defined as a system including multiple elements with different and variable individual behaviours which interact to produce the **overall system behaviour**. This definition clearly reveals that a large number of environmental, biological and even human systems can be qualified as complex. This **exceptional academic and clinical environment** training will broaden your horizon, provide you with **a rich interdisciplinary educational experience in biomedical engineering** and prepare you for your professional career in optimal conditions with **more than 8 months of internship in laboratories or companies.**

ARE YOU READY TO BECOME A BICULTURAL ENGINEER?

You will become a bicultural engineer specialized in biomedical engineering and get 140 ECTS credits at the end of your course. You will be highly valued by companies looking for international engineers offering management and technical skills.

During your two years at Centrale Méditerranée, you will discover a broad range of experiences and learn a lot from an academic standpoint but also in human terms:

- soft-skills development,
- work and research placements,
- discovery of France and Europe, French language proficiency.

FOR WHOM?

The Master's programme is designed for undergraduate students with a strong background in sciences: licence/bachelor's degree in physics, mechanics, applied mathematics or engineering sciences.

The master's course is fully taught in English - B2 level (independent user) is required.

Direct entry in M2 is possible with a validated M1 (60 ECTS) or relevant professional experience.

You will be highly valued by companies looking for international engineers

BIOMEDICAL ENGINEERING PROGRAMME

YEAR 1

1ST SEMESTER
PROPAEDEUTICS

- Transport phenomena
- Computer sciences and Numerical methods
- Introduction to clinical medicine
- Introduction to material science and structural design
- Introduction to biomedical signal and image processing
- Engineering & biological systems
- Wave propagation
- Management
- Language class
- Seminars, conferences
- Project based training
- Winter intership in lab (8 weeks)

2ND SEMESTER
IN-DEPTH SCIENTIFIC LEARNING

- The living bricks
- Imaging and wave therapy
- Biotechnologies and chemical therapies
- Bio Planet
- Language class
- Project based training
- Summer internship in company (8 weeks)

YEAR 2

1ST SEMESTER
KNOW-HOW

- Advanced imaging
- Biomechanics
- Computer Sciences and data sciences
- Integrated design of biomedical systems
- Advanced image processing
- Numerical modelling for Biomedical engineering
- Advanced material sciences and structural design
- Sensors & biomedical monitoring
- Industrial engineering
- IoT for medecine
- Language class
- Elective courses shared with international academic & research partners
- Lab work
- Seminars
- Project based training

2ND SEMESTER
MASTER'S THESIS

Paid internship in lab or company (4-6 months)

HOW TO JOIN US?

WHAT TYPES OF CAREER CAN YOU PURSUE?

The master's programme is designed for the main biomedical engineering specialities: **biomechanics, medical imaging, biomedical instrumentation, orthopaedics, clinical engineering**, etc. Your scientific & technical skills as well as those acquired in project management and change management will open up numerous employment opportunities, in particular in Research & Development engineering, consultant engineering, audit engineering, academic project engineering, and management.

You can also pursue your studies with a PhD in a field related to the M2, in academia or jointly with a company.

RECRUITMENT PROCESS

The recruitment process is organized in three stages:

- Please contact us by email at msct-cse@centrale-marseille.fr
  We will send you all the relevant information (procedure to apply, schedules, costs).
- Your application will be examined by the teaching team, who will contact you as soon as possible.
- If your application is eligible, an interview will be organized.

The Master's courses will start on September.

ANNUAL TUITION FEES

6 743 € (EU/EEA citizens)
10 270 € (Non-EU/EEA citizens)

Students enrolled in or coming from either a member institution of the RMEI or a partner institution of the Ecole Centrale de Marseille with which an agreement has been signed: please contact us regarding the tuition fees.

CENTRALE MÉDITERRANÉE

WE HAVE A WORLD TO TRANSFORM

THE "CENTRALE" BRAND

Centrale Méditerranée is a Public Scientific, Cultural and Professional Establishment (EPSCP) that belongs to Ecoles Centrale, an internationally-reputed higher education group with a powerful global network of **35,000 alumni.**

For employers, recruiting graduates of the Ecole Centrale is an assurance that you will be taking on people with strong scientific and technical skills combined with the talent to design and lead complex and innovative projects.

RESEARCH ENVIRONMENT

Centrale Méditerranée has **8 labs** in chemistry, physics, mechanics, chemical engineering, and computer sciences. These top-ranked laboratories are linked to the national scientific research centre (CNRS) and are renowned for their high-quality scientific research in France and abroad.

STUDENT LIFE

Student clubs are part of the student experience: International Students, Engineers without Borders, Sports & Sailing, Arts, Fablab Marseille, Ginfo (IT) and E-Gab (robotics), among others.During your student life you will develop a spirit of mutual success and human respect, the determination to initiate solutions and solve problems, and a sense of societal responsibility.

STUDY IN MARSEILLE AND DISCOVER PROVENCE!

- 300 sunny days per year
- Second largest city in France (870,000 inhabitants), close to the Parc National des Calanques
- Beautiful Region Sud, with cities such as Arles, Aix-en-Provence, Avignon and Nice
- Marseille-Marignane Airport, 3rd-largest French airport serving 26 countries
- High-speed train destinations from Marseille: Lyon (1hr30), Paris (3hrs), Barcelona (5hrs), Madrid, Frankfurt and Brussels among others.

www.centrale-marseille.fr

Please check the Centrale Méditerranée website for the latest information and details about the Master's programmes.
https://com.centrale-marseille.fr/page/cse/

CONTACTS

Prof. Olivier Boiron
Head of Master's programme
UNESCO Unitwin 651 Chair holder
msct-cse@centrale-marseille.fr

Campus Marseille
Technopôle de Château-Gombert
38, rue Frédéric Joliot-Curie
13451 Marseille Cedex 13

Campus Nice
Bâtiment Premium Meridia
61/63, avenue Simone Veil
06200 Nice

www.centrale-marseille.fr

CentraleMarseille
CentraleMars
Centrale Marseille
CentraleMars
CentraleMarseille

Centrale Méditerranée

Com Centrale Méditerranée – 09/2022 – photo : © Didier Nadeau