Master of science and technology in complex systems engineering*

BIOMEDICAL ENGINEERING

FULLY TAUGHT IN ENGLISH
STATE ACCREDITED PROGRAMME
A “complex system” can be defined as a system encompassing 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. By following the Msc&t programme you will find an **exceptional academic and clinical environment** that 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.

**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 Marseille, 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.

**“You will be highly valued by companies looking for international engineers”**
BIOMEDICAL ENGINEERING PROGRAMME

YEAR 1

1ST SEMESTER – PROPÆDEUTICS
+ Transport phenomena
+ Computer sciences
+ Introduction to clinical medicine
+ Introduction to material science
+ Introduction to signal and image processing
+ Engineering & biological systems
+ Wave propagation
+ Management
+ Language
+ Lab work, seminars, conferences

2ND SEMESTER – IN-DEPTH SCIENTIFIC LEARNING
+ Soft matter and microfluidics
+ Tissues modelling
+ Anatomy and pathology
+ Imaging and wave therapy
+ Molecular therapeutic strategy
+ Pharmaceutical process
+ Bioinformatics
+ Inorganic biochemistry and bioinspired chemistry
+ Industrial engineering
+ Language

YEAR 2

1ST SEMESTER – KNOW-HOW
+ Advanced photonics
+ Biomechanics
+ Integrated design of biomedical systems
+ Advanced image processing
+ Numerical modelling for Biomedical engineering
+ Advanced material sciences
+ Sensors & biomedical monitoring
+ Industrial engineering
+ Language
+ Elective courses shared with international academic & research partners
+ Lab work, seminars, conferences

2ND SEMESTER – MASTER’S THESIS
(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

Paper application deadline 15/06/2020.

The recruitment process is organized in three stages:

+ Please contact us by email by sending your CV + cover letter. We will send you all the relevant information (programmes, 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 2020.

ANNUAL TUITION FEES

6 743 € (EU/EEA citizens)

1 0270 € (Non-EU/EEA citizens)

Students from partner schools/universities of the Group of Ecoles Centrale: please contact us regarding the tuition fees.
THE “CENTRALE” BRAND
Centrale Marseille 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
Ecole Centrale Marseille 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.
Please check the Centrale Marseille website for the latest information and details about the Master’s programmes. If you need to discuss the curriculum you can also contact:

Prof. Olivier Boiron  
Head of Master’s programme  
UNESCO Unitwin 651 Chair holder  

École centrale de Marseille  
Pôle de l’Étoile  
Technopôle de Château-Gombert  
38, rue Frédéric Joliot-Curie  
13451 Marseille cedex 13  
www.centrale-marseille.fr