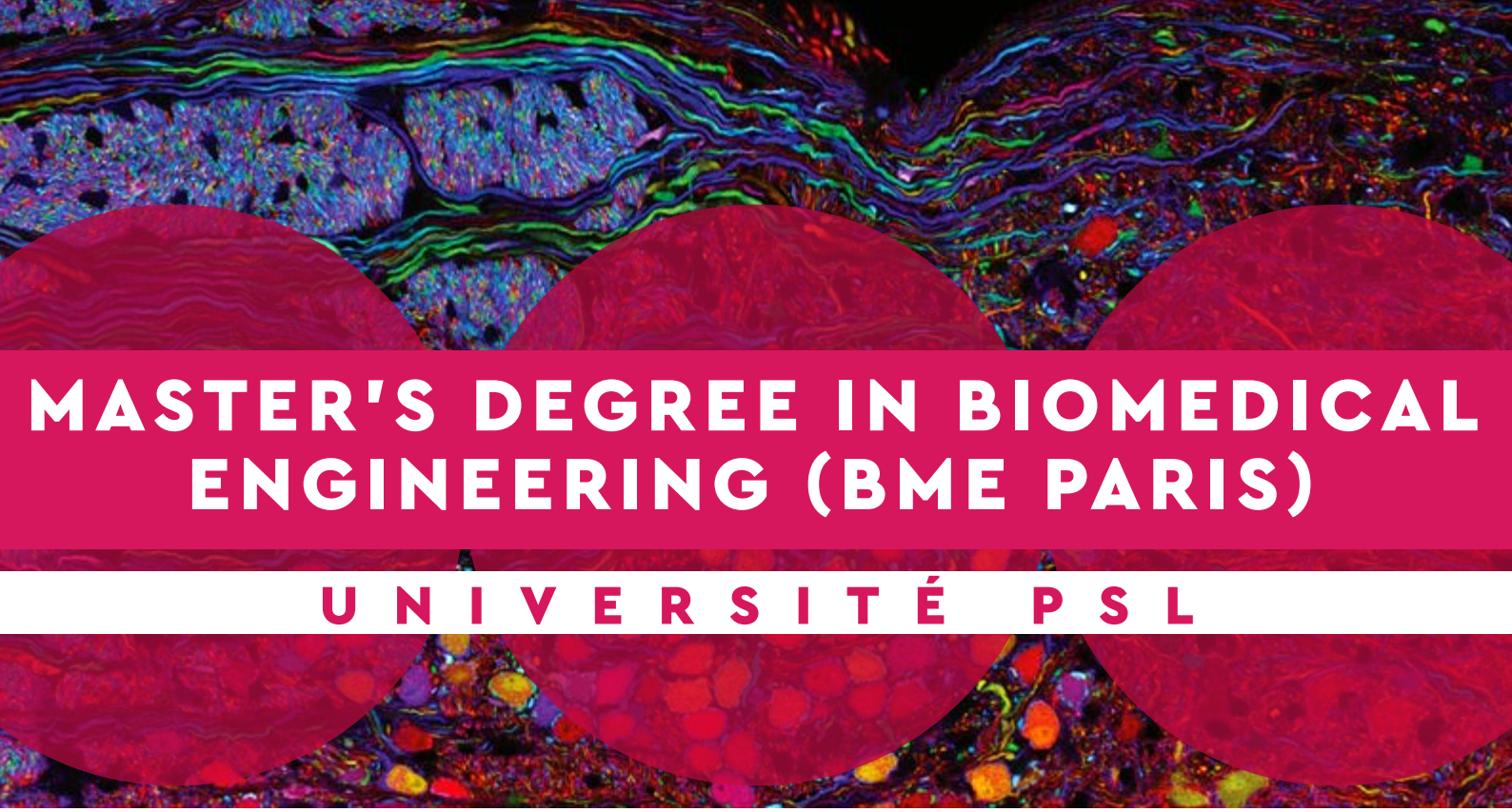

# MASTER'S DEGREE IN BIOMEDICAL ENGINEERING (BME PARIS)

## UNIVERSITÉ PSL

*The BME Paris Master is designed to provide a 2-year education program in the field of bioengineering, at the cross-road of biomedical and engineering sciences. It results from an unique partnership between Université PSL, Université de Paris and Arts-et-Métiers ParisTech. This Master is founded on an educational policy that favors interdisciplinarity and students' initiative as well as international perspective. This policy is supported by the top-level and complementary expertise and know-how of the three partners: engineering sciences in the three engineering schools within PSL (Chimie ParisTech – PSL, ESPCI Paris – PSL and Mines ParisTech – PSL) and Arts-et-Métiers ParisTech, on the one hand, and biomedical and health sciences at Université Paris-Descartes, on the other. This master's degree is part of the PSL's graduate programs in Engineering (ISAI) and Life Sciences.*

### LEARNING OUTCOMES

The BME Paris Master proposes a program of excellence intended for students with a wide variety of backgrounds (biology, chemistry, physics, mathematics, engineering as well as medicine, pharmacy and other health sciences...). The overarching goals of the Master are:
— To provide students with the knowledge and tools required in a wide range of the biomedical engineering fields.
— To foster a fruitful collaborative spirit between engineering and medical students, that will eventually bridge the existing "culture gap" between the corresponding professions.
While the second year offers five specialization tracks, the first year is devoted to strengthening and broadening students' skills in specific engineering and biomedical subjects.

### CAREER OPPORTUNITIES

— PhD in a field related to the M2 track, in academia or jointly with a company (CIFRE PhDs).
— R&D positions in large companies or startups, in most of the activities of the medtech and biotech sectors.
— Continuing medical or pharmacy school, or accessing it ("passerelle"), in either 2nd or 3rd year.
— Business programs in biotech management (ESCP, EM Lyon / Centrale Supelec...)

### MAIN ASSETS

— A unique and fertile collaboration between a leading medical university and top engineering schools.
— A very broad offer of highly interdisciplinary teaching units where scientists, engineers and clinicians address challenges at the forefront of bioengineering research.
— An international experience, with 30–40% of the students coming from abroad, almost all courses taught in English (except French for foreigners), and links with foreign laboratories for internships, especially at M1 level.
— An exceptional scientific environment within PSL, including several of the most prestigious research institutes in Paris (ENS, ESPCI Paris, Chimie ParisTech, MINES ParisTech, Collège de France, Institut Curie...).
— Strong links to the socio-economic and medical worlds: industry lecturers (e.g. from Thalès, Renault, Sanofi...), visits of hospital departments, attendance at medical congresses, a Business Plan workshop...
— A localization at the very lively and cultural heart of Paris.
—Specific support for international students (help with housing and administrative procedures, courses of French as a foreign language...)



***English track***

PSL UNIVERSITÉ PARIS

## CURRICULUM

### Master 1 (60 ECTS)

**1 single track proposed,** with individualized choices of teaching units according to students' backgrounds
It is devoted to strengthening and broadening students' skills in specific engineering and biomedical subjects. All teaching units are offered at two levels: basic and advanced.

**Two 2-month long internships** (or a single 4-month long) in academic labs of the partner institutions, R&D departments of large companies, biomedical startups or hospitals.

### Master 2 (60 ECTS)

**5 tracks proposed**
— Bioimaging (BIM)
— BioMaterials and BioDevices (BioMAT)
— BioMechanics (BioMECH)
— Molecular and Cellular Biotherapies (MCB)
— Bioengineering and Innovation in Neurosciences (BIN)

**One 5 to 6-month long internship**

*Almost all teaching takes place in the center of Paris, mostly at Université Paris-Descartes, Arts et Métiers ParisTech and Université PSL.*

## TRACKS (MASTER 2)

— **Bioimaging (BIM)**
The main goal of bioimaging is to improve human health by using imaging modalities to advance diagnosis, treatment, and prevention of human diseases. The BIM track offers high-level interdisciplinary education and training supported by the complementary skills of PSL, Paris Descartes and Telecom ParisTech. It also offers a double-diploma with the Biomedical Engineering Department at Columbia University (New York).

— **BioMaterials and BioDevices (BioMAT)**
Biomedical technologies greatly rely on the design of materials and devices interacting properly with living systems. The BioMAT track teaches scientists, engineers, and medical students how to face the numerous challenges of biomaterials and biodevices R&D. The lectures and projects train students to carry out collaborative, innovative and fruitful research at the interface between materials and biomedical sciences and medicine.

— **BioMechanics (BioMECH)**
BioMECH provides fundamental tools and in-depth knowledge on the biomedical applications of mechanics and related fields. The lectures, team projects, case studies, and engineering and invited conferences by academic, health and industrial experts enable students to benefit from a stimulating environment.

— **Molecular and Cellular Biotherapies (MCB)**
MCB provides an advanced training to two major categories of biotherapeutic applications: cell and gene therapy, and biopharmaceuticals. The former aims at using 'custom' therapeutic agents created for individual patients, a domain in which few manufacturers yet operate. Biopharmaceuticals are complex macromolecules produced via genetic manipulation of living organisms, in contrast to conventionally synthesized small molecules.

— **Bioengineering and Innovation in Neurosciences (BIN)**
BIN aims at bridging the gap between basic, clinical, and engineering neurosciences. It is now a key issue for both industry and medicine, because (i) prevalence of neurodegenerative diseases and sensori-motor handicaps is fast rising, and (ii) an ever-broadening range of companies (transportation, sports, defense, video games...) need to understand « the human factor », i.e. how we interact with ever more complex technical environments.

## ADMISSIONS

**Prerequisites**
Bachelors from scientific fields (biology, chemistry, physics, mathematics, engineering as well as medicine, pharmacy, dentistry and other health sciences...), graduates from the PSL CPES, students from ENS Paris and the PSL engineering schools.
Residents in medical, dental and pharmacy schools, ENS and engineering students may apply directly to the 2nd year (M2), as well as students who have validated an M1 in a relevant field. International students may also apply directly to the M2, under certain conditions.

**Application process**
Online application and interview for preselected candidates.

**Diploma delivered** : Master's level diploma from Université PSL and prepared at ESPCI Paris – PSL.

**To apply**
bme-paris.com
**Contact**
contact@bme-paris.com

BME PARIS BioMedical Engineering MASTER'S PROGRAM

DIPLÔME NATIONAL DE MASTER CONTRÔLÉ PAR L'ÉTAT

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