MASTER BME-PARIS
PARIS DESCARTES-PSL-Arts & Metiers

Biomedical Imaging Track

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1. Telecom Paris,
2. Université Paris Descartes

BME PARIS — BioMedical Engineering MASTER'S PROGRAM

International Master of Biomedical Engineering

Joint diploma between Arts et Metiers, PSL and Paris Descartes

Teaching goals :
- International recruitment and courses taught in English.
- General biomedical engineering education and specialization into a specific field.
- Topics on clinical, engineering and basic science.
- Efficient interdisciplinary scientific dialogue.
- Ethical, Industrial, and Clinical issues.
- Social and cultural interaction.

Teaching tools:
- Common general Bioengineering education
- Mixing clinical, engineering, biology and basic science students and faculty.
- Seminars, conferences & inter-track courses
- Ethical, clinical & industrial teaching, exchanges
- Interdisciplinary integration week
- Common "headquarters" & networking activities

- **Mater program chairs:**
  - Sophie Bernard (Université Paris Descartes)
  - André Klarsfeld (PSL)
  - Sébastien Laporte (Arts et Métiers)

5 Tracks

Curriculum

In M1 (semesters 1 and 2), there is one single track, with individualized choices of courses according to students' backgrounds.
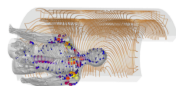
- **Master 1**

The M2 (semesters 3 and 4) offers five tracks:

- **Bioengineering and Innovation in Neurosciences (BIN)**
- **BioImaging (BIM)**
- **BioMaterials and Biodevices (BioMAT)**
- **BioMechanics (BioMECH)**
- **Molecular and cellular biotherapies (MCB)**

Cross-track Teaching

- Weekly "**Open your mind**" seminar with high-profile international speakers

- One week "**Interdisciplinary seminar**"

Biomedical Imaging (BIM) Track

Semester 1

Mandatory courses

Open Your Mind Seminars
Interdisciplinary week (3 ECTS)
Medical Image Analysis (6 ECTS)

One course (6 ECTS) to be picked among

Physics for BioImaging
Chemistry for Bioimaging : Basics, probes and nanomedicine
Optical Imaging

15 ECTS (minimum) to be picked among

Molecular Imaging (3 ECTS)
Functional and Metabolic Imaging (3 ECTS)
Quantification for Diagnosis (3 ECTS)
Quantification for Neuroimaging (3 ECTS)
Quantification for Bioimaging (3 ECTS)
Machine Learning (3 ECTS)
Physics for BioImaging (6 ECTS)
Chemistry for Bioimaging : Basics, probes and nanomedicine (6 ECTS)
Optical Imaging (6 ECTS)
Advanced Optical Imaging (3 ECTS)

Some teaching units may be chosen in other tracks (subject to track chairs' authorizations):

A window into the mind : new technologies to explore and stimulate the brain (3 ECTS, BIN track)
Brain-Computer Interfaces: from modeling to engineering (3 ECTS, BIN track)
Basics in Tissue and Cell Biology (3 ECTS, BioMAT track)
Practical training: hands-on state-of-the-art tech (3 ECTS, BioMAT track)
Biosensors for medical diagnosis (3 ECTS, BioMAT track)
Anatomy of the Musculo-skeletal System (3 ECTS, BioMECH track)
Research Methodology (3 ECTS, BioMECH track)

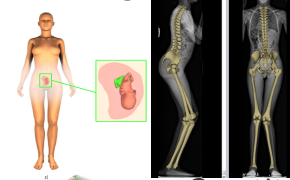### Semester 2

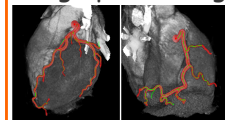Ethical and Industrial Aspects (3 ECTS)
Research Internship (27 ECTS)

Contrast agents
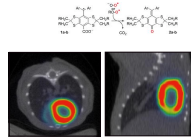
Anatomical modeling
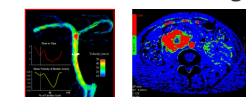
Imaging platforms

Image processing
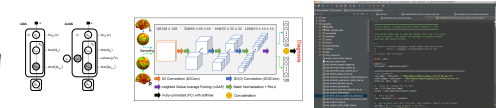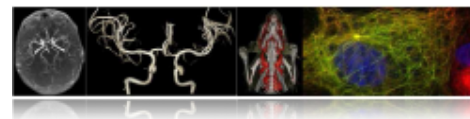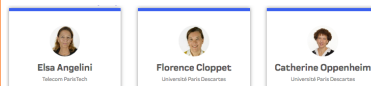
Quantitative Imaging

Machine Learning

BIM: Academic and clinical partners

BIM: Contacts & Information

Track chairs

Elsa Angelini — Telecom ParisTech
Florence Cloppet — Université Paris Descartes
Catherine Oppenheim — Université Paris Descartes

Pedagogic Committee

Charles-André Cuenod (Université Paris Descartes)

Petr Dokladal (Mines ParisTech)

Pierre-Yves Frappart (Université Paris Descartes)

Pietro Gori (Telecom Paris)

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