CENTRALE LYON

International Master Biomimicry and Surface Engineering

Degree level: Master
Training time: 2 years
Language: English
Status: Student
Campus: Lyon-Ecully Campus

Objectives



The Biomimicry and Surface Engineering master's degree trains scientists specializing in materials science and surface engineering through an innovative approach integrating biomimicry and ecological transition.

This master's program aims to:

- Train scientists specializing in materials science and surface engineering
- Promote a cross-disciplinary approach to biomimicry
- Integrate the ecological transition into materials design and manufacturing
- Develop skills in digital science applied to materials and surface engineering

Program

Biomimicry and surface engineering: from the Lotus effect to climate change

This program offers a cross-disciplinary approach, blending **biomimicry**, **ecological transition**, **surface fabrication and functionalization**, and **digital science**. Students benefit from solid theoretical training enriched by varied activities, such as **practical work** and projects in collaboration with the SURFAB technology platform.

Semester 1

Scientific teaching units

- Mathematics
- Computing science
- Biomimicry
- Materials and Mechanical Engineering
- Physical measurements
- Surface manufacturing (high-temperature processes)
- Biomimetic research project and project management

Cross-disciplinary teaching units

Foreign language (including French)

Semester 2

Scientific teaching units

- Bio-inspired surface engineering

- Biology and living systems
- Polymers materials and eco-conception
- Optics and photonics for engineers
- Physics and chemistry of surfaces
- Research internship

Transversal teaching units

- Foreign language (including French)
- Intercultural studies

Semester 3

Scientific teaching units

- Surface manufacturing: 3D additive manufacturing, femtosecond laser texturing
- Characterization of surfaces and nanostructures
- Numerical methods, from nanoscale to macroscale
- Climate change
- Advanced research project in biomimicry
- Tribology
- Living tribology

Semester 4

6-month research internship in a laboratory or company.

Diploma and certification

This course awards a national master's degree - controlled by the State.

DIPLÔME NATIONAL DE MASTER CONTRÔLÉ PAR L'ÉTAT

Career opportunities

The Master's degree in Materials Science and Engineering - Biomimicry and Surface Engineering - prepares students for further study towards a **doctorate** or for careers in R&D in various sectors such as **energy**, **transportation** (land, aeronautical, maritime), **medical** and **materials**.

Graduates can become interdisciplinary project managers, researchers, teachers. Areas of expertise covered include engineering, materials, surface science, surface treatments, surface engineering and biomaterials.

Focus

This master's program is based on the Laboratoire de Tribologie et Dynamique des Systèmes, considered to be **the world's leading laboratory** for **engineering sciences** .

Students also have access to SURFAB's technical and scientific resources: **3D printing**, **treatment and texturing of surfaces** using ultra-short LASER processes...

Admission requirements and application

Pre-requisites

- Master 1: Licence or Bachelor's degree in a scientific subject related to the Master's topics.English level B2.
- Master 2: M1 passed in a subject related to the Master's topics. English level B2.

Application

Applications are considered on the basis of a portfolio.

Discover application procedures

Tuition fees

Knowing and anticipating your expenses is essential before making a serene commitment to training.

Discover master's tuition fees Discover the average study budget at Centrale Lyon

Administrative contact

Education department - International Masters

Information and registration

scolarite.master-lyon@listes.ec-lyon.fr

Educational contact

Valette Stéphane

Enseignant-Chercheur

stephane.valette@ec-lyon.fr

Useful link

- Discover the training syllabus