

MASTER WATER & WIND ENGINEERING



ENVIRONMENT, INFRASTRUCTURE, POLLUTION, CLIMATE, GEOHAZARDS

- Master in Environmental Fluid Mechanics
- 4 semesters, taught in English at the Ecole Centrale de Lyon
- Theory and practice, with extensive laboratory studies and numerical simulations
- At least 3 months of project work and 6 months of internship or laboratory research project
- Possibilities for studies abroad with one of our partner establishments



OBJECTIVES

Provide the next generation of scientists and engineers with the multidisciplinary skills needed, in the field of environmental fluid mechanics, to facilitate and drive the environmental and ecological transition to a more sustainable environment. The skills learnt in this master will be applicable both to reducing human impact on the environment and reducing environmental impact on human activities, particularly resulting from climate change.

SCIENTIFIC DISCIPLINES

- Fluid Mechanics
- Thermodynamics
- Meteorology
- Oceanography
- Hydraulics
- Hydrology

APPLICATIONS

- Construction
- Energy
- Water resources
- Climate change
- Natural hazards & environmental risk
- Air quality

PREREQUISITES

Bachelor of Science

Preferably in **Civil and environmental engineering, Engineering science, Mechanics, Physics, Mathematics**

Minimum Level in English: B2



ÉCOLE
CENTRALE LYON

COURSE PROGRAMME

1ST YEAR

S1
September - January

Mathematics for engineers
Probability & statistics
Computing for engineers
Fundamental fluid mechanics
Advanced fluid mechanics
Environmental economics
Environmental law
Risk and decision
Design project
Languages (French/English)

S2
February - June

6 Electives, chosen from:
<ul style="list-style-type: none"> • Physics and modelling of free surface flows • Introduction to meteorology and oceanography • Geographical Information Systems • Space physics and solar-terrestrial coupling • Urban water management • Numerical methods in mechanics • Chaos and fractals • Introduction to random vibrations • ...
Computational Fluid Dynamics
Research project (2 months)
Languages (French/English)

2ND YEAR

S3
September - March

Choice of two specializations:
Water Engineering
River Hydraulics
Ocean & Coastal Engineering
Oceanography
The physics of turbulent flows
2 from:
<ul style="list-style-type: none"> • Boundary Layer Meteorology • Climate change • Fluid-structure interaction • Applied engineering statistics • Environmental and Technological Hazards
Hydrology & Hydrogeology
Air quality
Resources, energy, climate and society
Urban hydrology
Wind Engineering
Boundary Layer Meteorology
Climate change
The physics of turbulent flows
3 from:
<ul style="list-style-type: none"> • River hydraulics • Oceanography • Ocean & Coastal Engineering • Fluid-structure interaction • Applied engineering statistics • Environmental acoustics • External aerodynamics • Environmental and Technological Hazards
Hydrology & Hydrogeology
Air quality
Resources, energy, climate and society
Urban hydrology

S4

Research project in a laboratory or internship in the R&D department of a company.

GRADUATES FROM THE MASTER PROGRAMME WILL HAVE ACQUIRED A WIDE RANGE OF SKILLS:

- A sound theoretical understanding of the basic physical processes involved in environmental fluid mechanics
- The ability to mobilise that understanding to explain and model complex multi-disciplinary physical problems
- The knowledge to integrate considerations of climate change, biodiversity and ecology into engineering solutions
- The capacity to design sustainable solutions in the field of civil and environmental engineering
- The skills in project management that will be needed to develop and implement these solutions, in a multidisciplinary context

CAREER OPPORTUNITIES FOR GRADUATES:

- Civil engineering, Energy and Transport sectors
- River management, coastal protection, urban water management
- Renewable energy – wind turbines, hydropower, marine energy
- Urban environment – urban climatology, air quality, building ventilation
- Research & development – PhD, academic sector, research centres



CONTACT

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