



**Master of Science (MSc)**

**City and Urban Environments**

**ATMOSPHERE, WATER AND ENVIRONMENT**

**OBJECTIVES**

This MSc develops skills for addressing environmental and health issues in the context of sustainable urban development, in research and in urban engineering.

The programme is designed to provide the scientific theoretical knowledge and tools necessary to understand and address the environmental physical problems resulting from the ever increasing urban population. Various key disciplines such as urban hydrology, urban atmosphere, building heat transfer and pollution of air water and soils are taught through advanced lectures and research work in laboratories renowned in these fields.



**SKILLS**

**Specialism-specific**

- > Understand the physics and dynamics of fluids in urban environments
- > Master analysis and modelling tools for hydrology and atmospheric sciences in urban environments
- > Learn techniques of water management, treatment of soil, water and air, and mitigation of the urban heat island

**General**

- > Express assumptions to solve and analyse a problem
- > Communicate comprehensive results in a meaningful way
- > Undertake bibliographic surveys from international research and professional literature
- > Manage or be part of a project

**JOB PROSPECTS & FURTHER PHD STUDIES**

**SECTOR:** Urban planning; Urban environment, Energy, pollution, soil and water management

**FIELDS:** Environmental fluid mechanics, Hydrology, Microclimatology, Air quality.

**JOB POSITIONS:** Engineer in consulting office or groups specialized in environmental engineering, Engineer in urban design and planning office or local authorities; Research and academia (post PhD)





**Location**  
Nantes, France -2 hours from Paris

**International campus life**

**87** nationalities  
**43%** international students



Master of Science (MSc)

## EXAMPLES OF FINAL YEAR INTERNSHIP/MASTER'S THESIS

- > Influence of climate change on the behaviour of buildings in their urban environment
- > Study of the turbulence structure in the lower urban atmosphere using LIDAR measurements
- > Preliminary studies for the implementation of an experimental campaign of flux measurements by dual-wave scintillometry in an urban environment
- > Combining dynamic modelling and long-term ground based FTIR remote sensing for the characterization of air masses above Paris megacity
- > Formation of urban aerosols

## FACULTY, PARTNERS AND RESEARCH LABS

This MSc relies on the Centrale Nantes' faculty and the research facilities of the LHEEA Laboratory.

The programme has collaboration with:

Local authorities: Nantes Métropole

Engineering and consulting companies, design offices in water, air quality, urban planning & environment sectors: Veolia, Artelia, Ginger Burgeap, SOLENEOS

Public establishments: Scientific and Technical Centre for Building (CSTB), CEREMA, IRSN, EDF R&D

Research laboratories: LHEEA, IRSTV (Research Institute on Urban Sciences and Technology), Ecole des Ponts Paris Tech (CEREA), Gustave Eiffel University (LEE Department)

## OTHER PROGRAMME INFORMATION

- > Length of Studies: 2 years
- > Language of instruction: English
- > 3 semesters of courses and 1 semester of Master's thesis

**Tuition & Fees - Scholarships - Application process - Deadlines**

**MORE INFORMATION AND FULL PROGRAMME:**  
[www.ec-nantes.fr/masters](http://www.ec-nantes.fr/masters)

**CONTACT:** [master.admission@ec-nantes.fr](mailto:master.admission@ec-nantes.fr)

## CONTENT AND COURSES

(A Master Degree requires the validation of 120 ECTS credits)

M1 - AUTUMN SEMESTER	ECTS
Fluid Mechanics 1	5
Algorithmics for Engineering Modelling	4
Energetics and Building heat transfers	5
Introduction to Geographic Information Sciences	5
Introduction to research	5
Business Environment	4
Modern Languages	2
Conferences	0
M1 - SPRING SEMESTER	ECTS
Hydrology and transfers in soils	5
Introduction to Computational Fluid Dynamics	5
Urban Realities Review	5
Urban Management and Planning	4
Fluid Mechanics 2	5
Environmental Data Analysis	4
Modern Languages	2
M2 - AUTUMN SEMESTER - IN FRENCH	ECTS
Turbulence: theory, modelling and analysis	5
Meteo & atmospheric boundary layers	4
Urban pollution	5
Urban water management and modelling	5
Urban climate and energy	5
Modern languages	2
Case studies in the urban environment	4
Conferences	0
M2 - SPRING SEMESTER	ECTS
Master Thesis or Industrial Internship (paid)*	30

\*In France, for internships exceeding 2 months a minimum legal level of remuneration (approximately €600 per month) is fixed by the government. In some professional branches, this amount may be higher.

NB Course content may be subject to minor changes

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