



## 2<sup>ND</sup> AND 3<sup>RD</sup> YEAR SPECIALISATION

# ENGINEERING SCIENCE FOR HOUSING AND URBAN ENVIRONMENT

Acquire strong and multidisciplinary scientific skills relating to the physics of city and housing, to meet the major contemporary challenges of city management and design regarding the adaptation to changes and ecological transition. After the core courses, students choose between two options on offer: the Housing option offers specific training for building design; the Urban Engineering option offers training oriented towards management methods of the city and urban environment.



## COURSE CONTENT

### CORE COURSES

- > Urban issues
- > Ecology, city and land
- > Construction and structural analysis
- > Information systems and databases
- > Applied thermodynamics
- > Urban hydrology and atmosphere
- > Acoustics, light and solar radiation
- > Introduction to Building Information Modelling
- > Project 1 and 2 Urban issues

### HOUSING OPTION:

- > Building technology
- > Thermal performance of buildings
- > Air treatment and conditioning
- > Materials for housing

### URBAN ENGINEERING OPTION:

- > Energy at the city scale
- > Applied urban hydrology and atmosphere
- > Management of noise and soil pollution
- > Planning and transport



## INDUSTRY SECTORS

- > Engineering consultancy
- > Inspection and certification bodies
- > Technical centres
- > Local and regional authorities
- > Specialist Institutes
- > Large groups for urban development and service

## CAREER PROSPECTS

- > Engineer in thermal technology and energy efficiency of buildings
- > Engineering consultant in urban engineering
- > Construction site engineer (new build / renovation)
- > Consulting engineer in sustainable development, energy-building, environmental performance of projects, etc.
- > Urban development and innovations project manager

## TEACHING STAFF

### HEAD OF SPECIALISATION:

Isabelle Calmet

### LECTURERS:

Isabelle Calmet, Patrice Cartraud, David Chalet, Jean-François Hétet, Jean-Yves Martin, Pierre Marty

### EXTERNAL SPEAKERS:

CEREMA  
BRGM  
Saunier Duval  
WSP  
SARATEC  
Akajoule  
Bouygues  
ESO

### CONTACT:

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## EXAMPLES OF PREVIOUS PROJECTS

- > Indicators for Eco-districts
- > Drinking water network
- > Regional energy efficiency
- > Energy consumption forecast (Nantes Métropole)
- > Energy study of a village (Saint-Fiacre sur Maine)
- > Urban mobility diagram
- > Car-free city
- > Olympic Games and World Cup: impact on the urban development of Rio de Janeiro
- > Structural calculation of a hotel in Lebanon
- > Comparative study of wood vs. concrete house
- > Thermal performance of buildings: case study
- > Design of a bioclimatic childcare centre (architecture competition)
- > Sustainable house
- > Implementation of E+ C- regulations (Bouygues)

## EXAMPLES OF PREVIOUS INTERNSHIPS

- > Construction site (Bouygues Construction) to renovate the Santé prison in Paris
- > Sustainable development approach (Guarani - Brazil)
- > Management of urban development projects (ARTELIA)
- > RE 2020 and low carbon construction (Bouygues Bâtiment)
- > Energy design of the hospital center of Tours (AIA Ingénierie)
- > Methodology to support designers in reducing the urban heat island effect (OASIIS)
- > Energy instrumentation of Singapore Sport Hub (DG Energy Control, Singapore)
- > Design of an urban transport project (INGEROP Conseil & Ingénierie)
- > Infrastructure for the renovation of a tramway line (SEMITAN)
- > Thinking buildings as materials banks in Sweden (Anthesis Sweden AB)
- > 3D modeling of infrastructure elements and definition of BIM solutions on the 3Dexperience platform (Dassault Systèmes)
- > Deployment of digital tools for operating water networks (VEOLIA Eau)
- > Reliability and optimization of the dimensioning calculation tools for piles and mini-piles (Soletanche-Filiale VINCI)

