

# HEI

INGÉNIEURS  
POUR LE MONDE

yncréa 

## HEI, GRADUATE SCHOOL OF ENGINEERING

HOLISTIC APPROACH | INNOVATION |  
ENGINEERING | CO-DESIGN | PROJECT WORK |  
MULTI-DISCIPLINARY |  
SUSTAINABLE DEVELOPMENT |  
MODEL | ARCHITECTURE |  
ECO-NEIGHBOURHOOD | COMPLEXITY |  
TECHNICAL | ENGINEERING | CREATIVITY |  
TRANSPORT AND SUSTAINABLE MOBILITY |  
ENERGY | SMART GRIDS |  
MANAGEMENT OF INNOVATION

## MASTER OF SCIENCE AND ENGINEERING (MSE) SMART CITIES

[www.hei.fr](http://www.hei.fr)

# Smart Cities

## PROGRAM

Rampant Urban Development is accelerating worldwide accentuating needs for urban planning infrastructure and building technology as well as a social and economic issues.

Lille, HEI and the university Catholique de Lille are at the center of this third millennium industrial revolution engaged in the transition which results.

MSE-Smart Cities offers, in English, to international Students, Managers and future Managers the skills and competencies needed to succeed in these very important stakes in a wide variety of environmental disciplines professional orientation and employment success in numerous application and economic sectors, urban development, environmental management and habitat.

## ADD VALUES

### Cutting Edge pedagogy

During the student-centred learning program our students deal with real situations. They will create their own eco-neighbourhood design plan on the basis of a real site and project. During this design project they will be required to apply the knowledge that they have gained from all the different teachings. Cross-disciplinary experts bring their knowledge and know-how. This program is given entirely in English to develop communication skills in an international context.

### collaborative management

Smart cities are also changing the way that professionals are working. We need more and more implication and real engagement by all disciplines. New collaborative and innovative working methods and spaces are use in order to confront the reality of smart cities. This training program foster a creative attitude and collaborative behavior

### Intership

The program includes completion of full time team project and professional paid intership with companies or laboratories, in France or abroad, for a total duration from 10 to 12 months.

## Context

Today, we are facing a permanent technological revolution, which is across all markets, stakeholders and institutions. It is the fastest ever-changing context that we have ever seen, and it is universal. Today the smart city context is so complex that a single discipline cannot meet all the emerging technical, social and economic needs.

### The program will allow participants to :

- Develop analytical and planning skills within the context of an eco-neighbourhood, and to know how to develop an urban project with an environmental bias.
- To have an understanding of the holistic approach to resource management.
- Deepen their understanding of energy and the stakes involved; their applications to buildings; renewable energies - their production and distribution
- Integrate co-design collaborative working methods; innovation management

## General Engineering 42 ECTS

- Mathematics for Engineers, Electricity, mechanics, Innovation management, Team management, Business management, Project management, Collaborative management, Quality management, Accounting, Marketing, Intercultural communication....

## Workshop 13 ECTS

- Design eco districts, Buildings taking into account environmental issues, its integration into its context (social, economic, landscape), and architectural quality in a broad sense.
- These workshops are propose on a real site. (1 workshop by year)

## Ecology, Landscape, Ambiance 8 ECTS

- Become fluent in the importance of landscaping ambiance, the urban landscape, Public spaces, and the city.
- Conservation, water savings, equipments, rainwater use, recycling, types of water, calculations, indicators, soil permeability, aquifers, distribution networks, flow rate and losses.

## Building energy performance 10 ECTS

- Become able to perform building energy audits and diagnostics and the accompanying legislation, heating, central air treatment, climatic engineering, finite elements and modelization, heat transfer, codes and calculations, energy requirements and building renovation.
- Understand bioclimatic architecture design of building envelopes (climatic, thermal environmental analyses and carbon foot printing),
- Become knowledgeable about BMS and home automation, domotics, and the sustainable habitat,

## Tools & software applications 6 ECTS

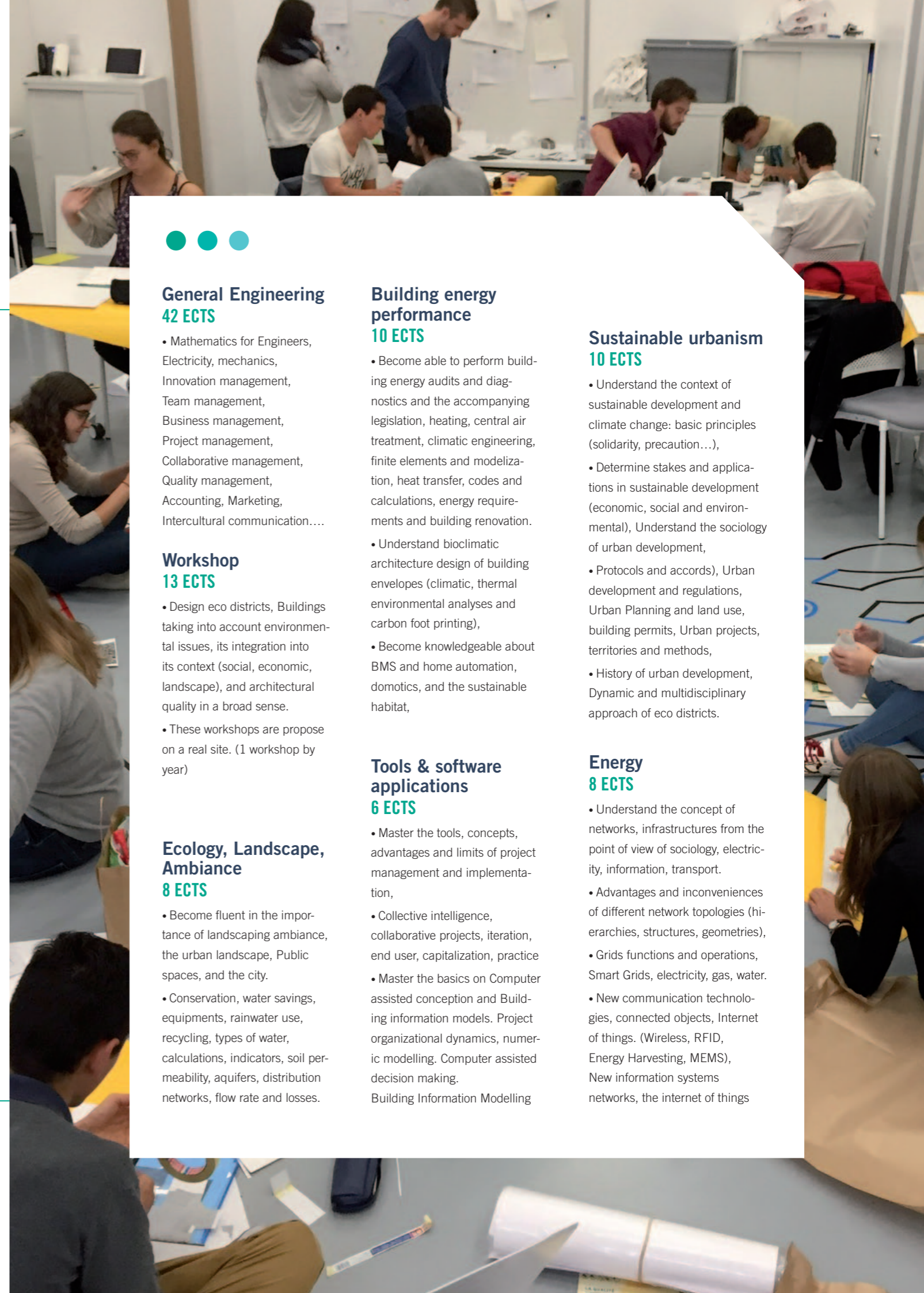
- Master the tools, concepts, advantages and limits of project management and implementation,
- Collective intelligence, collaborative projects, iteration, end user, capitalization, practice
- Master the basics on Computer assisted conception and Building information models. Project organizational dynamics, numeric modelling. Computer assisted decision making. Building Information Modelling

## Sustainable urbanism 10 ECTS

- Understand the context of sustainable development and climate change: basic principles (solidarity, precaution...),
- Determine stakes and applications in sustainable development (economic, social and environmental), Understand the sociology of urban development,
- Protocols and accords), Urban development and regulations, Urban Planning and land use, building permits, Urban projects, territories and methods,
- History of urban development, Dynamic and multidisciplinary approach of eco districts.

## Energy 8 ECTS

- Understand the concept of networks, infrastructures from the point of view of sociology, electricity, information, transport.
- Advantages and inconveniences of different network topologies (hierarchies, structures, geometries),
- Grids functions and operations, Smart Grids, electricity, gas, water.
- New communication technologies, connected objects, Internet of things. (Wireless, RFID, Energy Harvesting, MEMS), New information systems networks, the internet of things





There is no special  
talent  
only  
passionately  
curious



## Admission

### Admission prerequisites

- Bachelor of Science (or equivalent)
  - GPA : 3.0 or superior.
  - English B2 level ie. BULATS 60, TOEIC 785, TOEFL 87
- French B1 level upon graduation language and cultural training programs are available

Information and application form at : [www.hei.fr](http://www.hei.fr)



## Calendar

Starting date : September 2017

Deadline : 15 April 2017



## Tuition fees

10 000 € / year



## Contacts

[hei.master.smartcities@yncrea.fr](mailto:hei.master.smartcities@yncrea.fr)

## HAUTES ÉTUDES D'INGÉNIEUR

Siège : 13 rue de Toul BP 41290 - 59014 Lille Cedex - Tél. 03 28 38 48 58 - [www.hei.fr](http://www.hei.fr) - email : [ecole@hei.fr](mailto:ecole@hei.fr) / [hei.communication@yncrea.fr](mailto:hei.communication@yncrea.fr)  
HEI campus Centre : Site Balsan - 2 allée Jean Vaillé - 36000 Châteauroux - Tél. 02 54 53 52 90