



2SC5410 – Sustainable urban planning and development

Instructors: Frédérique Delmas-Jaubert

Department: DÉPARTEMENT MÉCANIQUE ENERGÉTIQUE PROCÉDÉS

Language of instruction: FRANCAIS

Campus: CAMPUS DE PARIS - SACLAY

Workload (HEE): 60

On-site hours (HPE): 34,50

Description

The specific course entitled Sustainable Urban Planning - AMUD - will provide the basic knowledge of the real estate and construction value chain, the emergence of smart cities. Traditional models of value creation are shaken, and new relationship between the circular economy, the city, and the environment appear.

Quarter number

ST5

Prerequisites (in terms of CS courses)

None

Syllabus

Human beings evolve in a framework that they help to shape: built environment, landscaped natural areas, transport infrastructures and public spaces are the ingredients of the living environment that we propose to study. These amenities and the behaviors of the men and women who live there have an impact on the natural resources of water, air and energy. All of these practices are today shaken by the rise of the digital economy.

"Ecoquartier" is a label by the French ministry of ecological transition

Introduction to the value chain and management of a construction operation

- Real estate development
- Urban scale
- Designers, contractors and other service providers: who does what?
- Economic value and environmental value



Management of complex systems

Circular economy applied to building processes

Smart city: GIS and user data

- Urban geography, a discipline that articulates spatial, temporal, human data ...
- The tools of Geographic Information Systems
- Graphic representation, dynamics and decision support
- Data property and digital business model

Smart city and Transports, le Grand Paris Express

Impact of urbanization on the water resource

- Effects of urbanization on the water resource
- Traditional and innovative techniques: industrial installations and alternative management
- Urban resilience and water risk management

the challenges of Agriculture, and urban agriculture

Energy

- Consumptions of buildings and new digital uses
- The question of scale and pooling: heat networks <> individual boilers
- Natural resources and their limits

Class components (lecture, labs, etc.)

This teaching includes:

- Lectures, delivered by different teachers on the campus of Gif
- In situ courses, delivered by teachers or temporary staff, traveling through a project area
- Thematic research to go deeper into a topic

22,5 hours of course

10,5 hours of tutorials

Grading

- thematic research (note 9/20) : time slots reserved to work in group, to prepare a written report. 10 pages max.
 - written control (1H30) (note 11/20)
- Total (/20)



Resources

The teaching team includes urban and architecture specialists as Frédérique Delmas, François Cointe, Olivier Ledru and Arnaud Lafont, teachers-researchers as Franck Marle, Yann Leroy, Flore Vallet and François Cluzel.

Learning outcomes covered on the course

Three main purposes about stakeholders, issues and digital transformation of the city:

- By the end of the course, the student is able to identify stakeholders in real estate and urban project (C1.1), to analyse an urban project from different point of view, comparing the positions avec different stakeholders (C4.1), to list social and environmental responsibilities of everyone, beyond their economic model (C9.2).
- By the end of the course, the student is able to link together the main economic, environmental, technical and human issues of an urban operation (C1.1) and to compare different kind of solutions (C3.6 et C9.4).
- By the end of the course, the student is able to report on the transformations of the urban services economy with the rise of the digital economy (C6.6).

Description of the skills acquired at the end of the course

C1.1 Examine a problem in full breadth and depth, within and beyond its immediate parameters, thus understanding it as a whole. This whole weaves the scientific, economic and social dimensions of the problem.

C2.1 Thoroughly master urban development domain, within every discipline involved and every scale.

C3.6 Evaluate the efficiency, feasibility and strength of the solutions offered.

C4.1 Think in client terms, identify and analyse customer needs, the constraints of other stakeholders as well as include societal challenges.

C6.6 Understand the digital economy applied to smart city concept and upheaval for traditional economic city actors

C9.2 Identify, within a given structure, the scope of liability as well as socio-ethical and environmental responsibilities.

C9.4 Demonstrate rigour and critical thinking in approaching problems from all angles, be they scientific, social or economic.