

# Sustainable urban Design Studio

## Titulaires

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## Mnémonique du cours

ARCH-H400

## Crédits ECTS

8 crédits

## Langue(s) d'enseignement

Anglais

## Période du cours

Premier quadrimestre

## Campus

Solbosch

## Contenu du cours

The course content is derived through **defining a sustainability problematic** in relation to the context analysis of a specifically selected **strategic site / urban area in the Brussels Capital Region** to develop a **SUDF** (Sustainable Urban Design Framework) as group work. The aim of the SUDF is to spatially articulate a **resilient, carbon-neutral and sustainable** transition and transformation of the selected site / urban area.

The content of the studio over 12 weeks comprises the specific **context analysis** (of social, environmental, economic, spatial, and historical aspects) for **problem definition** (1<sup>st</sup> 3 weeks), problem (re)formulation / conceptualization for setting **ambition & vision** spatially and programmatically (2<sup>nd</sup> 3 Weeks), testing alternative strategies and scenarios of resilience and carbon-neutrality for **design development** (3<sup>rd</sup> 3 Weeks), and **synthesis** (last 3 weeks). Underpinning this four-stage structuring of the content, the aim is to transform analysis of different aspects and issues into a synthesis vision for the selected area / neighborhood through formulating a SUDF:

- Unlike the traditional master plans, the framework approach embodies a process of creating and thinking through a set of situations.
- This framework must be a concrete spatial proposal and also define a range of possible scenarios over an extended period of time.
- Through such an approach, thus, students will develop their capacity in expanding the scale of the problem not only in space, but also in time – a crucial dimension of sustainable (urban) design for achieving ambitious targets of carbon-neutrality.

In terms of content, the SUDF (is expected to) spatially establish a set of sustainable urban design strategies & alternative scenarios for the transition and transformation of the site / urban area into a resilient, carbon-neutral and sustainable urban fabric illustrating in detail the following:

- **OPEN SPACE** structure, delineating **public spaces, green and blue network**, innovative **NBS (Nature-based Solutions)** for enhancing **ecosystem services**, etc.
- **MOBILITY** structure, delineating choices of **soft / active** (pedestrian, bicycle, etc.) & **hard** (vehicular, public transport, etc.) modes
- **FORM-DENSITY, 3D Forms** / building volumes, and appropriate densities, etc.
- **PROGRAM**, with a focus on **Mixed-uses, (social) Diversity**, etc.

A strategic & dynamic **DEVELOPMENT** framework that spatially embeds and integrates **circular metabolism, resilience, carbon-neutrality, phasing, flexibility, adaptability**, uncertainty and a multiplicity of **actors**.

## Objectifs (et/ou acquis d'apprentissages spécifiques)

The over-arching objective is to develop design skills and capabilities of students to comprehend, analyze and address sustainability issues at multiple scale levels (spatial and temporal) in an integrated way: from the scale of the building materials and systems to that of the spatial articulations at the urban and regional scales. This is achieved through defining a sustainability problematic in relation to a specifically selected complex site / urban area for each year to develop a **sustainable urban design framework** (SUDF, group work) in the form of a master plan and program that **spatially articulates a resilient, carbon-neutral and sustainable transitioning and transformation** of the selected site / urban area.

Underpinning the studio objectives is our premise that sustainability is not a static notion, a fixed ideal, or a set of principles/attributes that can be simply added onto a conventional design process, such as a building, district or a city. Sustainability ought to be an intrinsic value in design as a dynamic integrative framework with evolving concepts that must be redefined and reassessed with each new design process/project as an opportunity to do so. In pedagogical terms, therefore, we aim at exposing / sensitizing students to a higher level of complexity through exploring sustainable design: i) at different **scale levels** and **contextual specificities**; ii) as a process of **reflection and reformulation**; and iii) as an **integrated way** of using issues of sustainability, ecology and energy as catalyst for **creatively rethinking** conventional notions of **urban form, urban design and urban functioning**.

The course **specific learning outcomes** include that students learn *to comprehend and analyze the sustainability potential of a site, form a concept, devise a program, spatially and temporally articulate (SUDF) and architecturally substantiate (SAP) a specific sustainability position*.

- Question and take a critical attitude towards the elements at stake of a program and a site within the general context of Sustainable Development.
- Explore and analyze the sustainability potential of a site at different scale levels.

- Develop conceptual capabilities to comprehend the composition of complex urban organism

The studio contributes to the following **program 'specific learning outcomes'** (MSc in Architectural Engineering program), whereby, the student

- can develop an architectural or urban design project based on an analysis and synthesis of the context, program, structure, material and concept with particular attention to sustainability
- can communicate design concepts and projects effectively using state-of-the-art physical and digital representation techniques (drawings, images, renderings, and three-dimensional models)
- can expand the scale of the design problem not only in space, but also in time – a crucial dimension of sustainable design – and to comprehend the multi-scalar effects of design interventions.
- can critically analyse and reflect on the historical and theoretical context of architectural and urban projects
- has an integrative attitude towards using issues of sustainability, ecology and energy as catalyst for creatively rethinking conventional notions of enclosure, tectonics, and programme
- has design skills and research capabilities to address spatial and temporal complexity in the development of architectural and urban projects that ensures sustainable functioning of the built environment

## Pré-requis et co-requis

### Connaissances et compétences pré-requises

Prerequisites: **Courses requiring this course**

[[table]]

## Méthodes d'enseignement et activités d'apprentissages

Studio based design methods and learning activities. Using the city of Brussels as a lab, each year a specific site / area is chosen and an appropriate thematic focus (e.g. university & the city, student housing, brownfield redevelopment, urban housing, etc.) with a sustainability problematic outlined. From thereon, the methodology for teaching and learning activities comprises proceeding in 4 stages (problem definition, conceptualization, design development, and synthesis) supported by 5 process tracks: **Analysis; Theoretical component / guest lectures; Interactive discussions / coaching; Pecha-Kucha sessions; and Design Reviews / Critics.**

**Analysis** is the foundation upon which design frameworks and proposals are developed.

- This track will run throughout the semester structured by a series of design based research exercises / assignments exploring social, economic, demographic, environmental and physical aspects of the chosen area through data, maps, surveys, sketches, schemes/diagrams, photographs, models, and explorative scenarios, etc.
- Each of these exercises will allow exploring new aspect of the problem, adding new layers of complexity to the evolving sustainable design process.

**Theoretical component (TC) / guest lectures** are closely coordinated with the content of the studio with insights provided by specialists / actors / stakeholders in the form of guest lectures.

**Interactive discussions / coaching – individual & group:** Students' design process is guided interactively through daily feed-back sessions tailored to specific stage of the design, including problem (re)formulation, suggesting reference material / cases, reflections on the mode of analysis, alternative conceptualizations, highlighting missing aspects, critical appraisals, etc.

**Pecha-Kucha Sessions:** are organized as short presentations by 2-3 groups followed by comments / questions from the lecturers (and students) at the start of alternative studio days. These sessions (45 minutes max.) are required to be attended by all students and lecturers. Each group presents their state of the art in a short (5-10 minute) presentation (sketches, schemes, drawings, etc.) – a schedule is made at the beginning of the semester. These sessions allow other students to see the work of their peers, to improve their presentation and expression skills, to have a generalized feed-back and suggestions on the stage they are, and what is expected from them at that stage.

**Design Reviews / Critics:** Two main types of reviews are organized – a mid term (with internal jury) and a final review (internal and external jury) in each semester.

## Contribution au profil d'enseignement

This teaching unit contributes to the following (**program specific learning outcomes** / competences:

- ➤ develop an architectural or urban design project based on an analysis and synthesis of the context, program, structure, material and concept with particular attention to sustainability
- communicate design concepts and projects effectively using state-of-the-art physical and digital representation techniques (drawings, images, renderings, and three-dimensional models)
- expand the scale of the design problem not only in space, but also in time – a crucial dimension of sustainable design – and to comprehend the multi-scalar effects of design interventions
- critically analyse and reflect on the historical and theoretical context of architectural and urban projects
- an integrative attitude towards using issues of sustainability, ecology and energy as catalyst for creatively rethinking conventional notions of enclosure, tectonics, and programme
- design skills and research capabilities to address spatial and temporal complexity in the development of architectural and urban projects that ensures sustainable functioning of the built environment

The **general (Bruface) learning outcomes** / competencies that this course contributes to include the following:

- ➤ present and defend results in a scientifically sound way, using contemporary communication tools, for a national as well as for an international professional or lay audience
- collaborate in a (multidisciplinary) team
- a creative, problem-solving, result-driven and evidence-based attitude, aiming at innovation and applicability in industry and society

- critical attitude towards one's own results and those of others
- consciousness of the ethical, social, environmental and economic context of his/her work and strives for sustainable solutions
- flexibility and adaptability to work in an international and/or intercultural context

## Références, bibliographie et lectures recommandées

Ritchie A. & Thomas R. Eds. (2009). *Sustainable Urban Design* (London: Taylor & Francis).

Carmona M. & Tiesdell S. Eds. (2007). *Urban Design Reader* (London: Routledge / Arch. Press).

Moughtin, C., (2002). *Urban Design: Green Dimension* (London: Architectural Press).

Farr, D., (2008). *Sustainable Urbanism: Urban Design with Nature* (New Jersey: John Wiley & Sons).

Aurora Fernández Per, et al. (2014). *THIS IS HYBRID: An analysis of mixed-use buildings* (a+t).

Javier Mozas, et al. (2014). *Paradises: Urban Park Strategies* (a+t).

A+t research group (2013). *10 Stories of Collective Housing* (a+t).

## Support(s) de cours

Université virtuelle

## Autres renseignements

### Lieu(x) d'enseignement

Solbosch

### Contact(s)

Titular & Coordinator:

**Prof. dr. Ahmed Z. Khan**

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## Méthode(s) d'évaluation

Autre, Portfolio, Présentation orale, Projet, Travail de groupe et Travail personnel

### Méthode(s) d'évaluation (complément)

Two design reviews (a mid and a final review) are organized for project presentations in which oral and graphic examination of the design project (group work) is carried out using an evaluation matrix based on general and specific design criteria by the jury

(internal during mid-review, and the final-reviews include also external jury members).

The **general criteria** for assessment include:

- Maturity of global dealing with the project; Coherence; Ability to communicate concept, methods, strategies in a clear graphical way; Completeness of handed in documents.
- Demonstrate an awareness of responsibilities towards: the environment and sustainable development; social, economic and cultural issues; urban fabric; architectural and spatial quality
- Active participation in group assignments; attendance in studio (every Tuesday), discussions and guest lectures; presentations in pecha-kucha sessions.

### Detailed criteria and evaluation matrix

For each review, the specific criteria is delineated along three categories: **content (60%), graphics (25%) and presentation (15%)**.

The assessors include studio coordinator and teaching staff, and in the case of final reviews, also the members of invited external jury.

**Second Session Exam (Aug./Sep.):** For unjustified absence from studio (every Tuesday) during the semester and reviews (mid and final), there is no opportunity offered for the 2nd exam in August/September of the same year (Article 61, 28, 29 & 30 of the ULB exams and juries regulation). However, if valid, legitimate and convincing reason(s) are presented in writing (with proofs) a 2nd sit can be arranged for the student, at the coordinator's discretion.

Such students, and those who fail in the first session, will have to do the 2nd session exam individually. They will have to make an appointment with the coordinator as soon as possible (during June, latest by the 1<sup>st</sup> week of July) to define a project and deadline for submission, and a date for final exam – project presentation in front of the jury (Review).

## Construction de la note (en ce compris, la pondération des notes partielles)

Marks attributed in the following two reviews determine the final mark:

- Mid-Review-1 (with internal jury): Urban Analysis, Concept & Model – 30%
- Final-Review-1 (with internal + external jury): Urban Design framework: Master plan & program – 70%

Active participation in group assignments (analysis, model, etc.), guest lectures, discussions, pecha-kucha sessions, and minimum 75% attendance in the studio (every Tuesday) is required for being eligible for the exam (both mid and final reviews). Besides the specific weightage of assignments (analysis & model in Mid-Review-1), participation in these learning activities is evaluated as 'process' (15% marks) in all the reviews by the jury. Moreover, unjustified absence from these learning activities can also lead to ineligibility for the 2<sup>nd</sup> session exam.

## Langue(s) d'évaluation principale(s)

Anglais

## Programmes

### Programmes proposant ce cours à l'école polytechnique de Bruxelles

MA-IRAR | Master : ingénieur civil architecte | finalité Spécialisée/  
bloc 1 et MS-URDE | Master de spécialisation en urbanisme et  
aménagement du territoire | bloc U

### Programmes proposant ce cours à la faculté d'Architecture La Cambre Horta

MS-URDE | Master de spécialisation en urbanisme et  
aménagement du territoire | bloc U

### Programmes proposant ce cours à la faculté des Sciences

MA-GEOG | Master en sciences géographiques, orientation  
générale | finalité Urban studies/bloc 1 et finalité Urban studies/bloc 2