Syllabus – Elective Course

Course title:

Sustainable Cities

Credits:

6 ECTS credits

Teaching language:

English

Target students:

Undergraduate students in Business, Economics, Finance, Social Science, Science, Engineering, Sustainability, and any student interested in Corporate Social Responsibility and Sustainable Development

Teacher in charge of the course:

Benoît Guyot, MSc (FGES / Faculty of Economics, Management, Sciences, and Accounting, *Université Catholique de Lille*)

COURSE PRESENTATION

Prerequisite:

Students undertaking this course should normally have successfully completed at least one semester at university, or have equivalent experience. They must have some ability to work as a group and be able to communicate easily in English at a standard university level. In other respects, the course is intended to serve a mix of profiles and learning backgrounds for a more diverse international learning experience.

Content:

More than half of the world's population currently live in cities. Cities are both contributing to global challenges and are impacted by them. On the one hand, pressures from the outside create disruptive situations such as extreme weather events, supply disruption and migrations. On the other hand, some issues emerge locally, under the form of political crisis, social and environmental challenges, e.g. inequalities or pollution. As we live in a complex and interconnected world, none of these trends are totally disconnected from the outside of the city boundaries. The city is a system in which a population settle and access to livelihood. It can also be considered as a "subsystem" as it exchanges materials, energy, people, capital or information with its surroundings. In order to better understand the functioning of a city, the course participant will discover the language of a discipline known as "systems thinking", the organized study of *systems*, their feedbacks and their behaviour as a whole.

If we take the example of a territory, we see that a population does not only consume the resources (water, energy, food, etc.) that are produced locally. We measure the "ecological footprint" of a city calculating the area needed by its population to produce these resources and to absorb its pollution. According to a study made by the Environmental Agency (UK), the ecological footprint of the city of London equals 200 times the size of the city (4.5 hectares per person, summing up to 34 million ha). If the world population was producing, consuming, and emitting as much as that the population of the wealthiest countries, we would need two planets. So how do we, as a society, can create a world in which we ensure the same quality of life for everyone and the future generations?

The United Nations have set the 17 Sustainable Development Goals (SDGs) that define some objectives to be achieved by 2030. These global goals draw a road map for all countries to share the same targets. As cities have a great impact on the environment, how can urban population produce locally the resources they need in order to both become resilient to pressures from the outside and to create better livelihood for a growing population?

The goal of this class is to understand the sustainability issues faced by cities globally, to discover sustainability-related solutions and even imagine new ones. The learning experience will integrate theory and practice, with study visits and meetings with professionals. The course participants will go through an innovation process with creativity sessions and some prototyping activities.

1) **Introduction class**

Description of the global sustainability challenges and their relations with cities
Key concepts : The Sustainability Challenge, The Cylinder and The Funnel Metaphors, the Great Acceleration, the Planetary Boundaries (e.g. climate change), The Ecological footprint, global city trends : mega-cities and specific urban challenges.
Activities : Spaceship Earth, World Café

2) **Presentation of the sustainable development strategy of Lille**

Lille is the 5th largest city (urban area) in France. The urban-planning team of the city will present the key challenges of the Métropole Européenne de Lille : mobility, housing, energy and other utility services (water, waste management). *To what extent social and environmental issues are taken into account for the evolution of these public services?*

3) **Systems analysis of cities**

Operational analysis of a city from a sustainability perspective
Key concepts : Systems thinking and related concepts : reductionism / systemic, complexity and complex systems (dynamic equilibrium, negative / positive feedbacks, thresholds, delays, regime change), the example of natural cycles, definition of socio-ecological sustainability (Sustainability Principles, social sustainability).
Activities : The Fish Game, Impact analysis of the urban "vital functions" (social / environmental impacts, prioritization of impacts) (workshop)

4) **Study visit in Roubaix (identifying local challenges)**

The city of Roubaix has fostered a Zero Waste strategy that creates multiple benefits for its citizens. There are also dozens of initiatives related to circular economy, urban agriculture and social entrepreneurship to discover. We will start a conversation with some local entrepreneurs who will present their activities.
Key concepts : The Sustainable Development Goals (SDGs), The Third Industrial Revolution, innovative business models (Circular Economy, Product-Service Systems and the Sharing Economy, Social entrepreneurship / inclusive economy, the Makers movement)

Activities : Interviews with local entrepreneurs and decision-makers, brainstorming of solutions (workshop)

5) Prototyping (training) @ Maker space (e.g. Techshop)

We will discover the resources available at the maker space (wood, metal, textile, electronics, 3D printing), and we will explore how to use them to address our selection of city challenges.

6) Making change happen

We will get some inspiration with multi-stakeholders initiatives, and particularly those putting citizens at the heart of urban change - highlighting a few case studies:
Detroit (fabcities), Cleveland, and the people who are leading them Mu Wei (Wikiworld / World Children's Movement WOCC), Vivian Song (OpenHeartDesignFoundation / Studio Roosegaarde), Lionel Lourdin (Open Business Foundation), Ali Benfattoum (Citizen Clan), etc.
Key concepts: Strategic planning (forecasting / backcasting) and strategic management (Vision / Mission / objectives), Place-Making, Nest Cities, Co-ops, Open source hardware and software, Low-tech, etc.
Activities: Pro Action Café

7) **User interviews**

The participants will meet their users to
Key concepts: Design Thinking, Stakeholders
Activities: Interviews, Persona, Empathy map

8) Building a case for Sustainable development

The participants will start prototyping their solutions.
Key concepts: Lean Startup, User experience (UX)
Activities: Business model design, Story boards and quick prototyping

9) **Concept formalization**

The teams will prepare their final presentation and their pitch. Final exam.

10) Prototyping #1 @ Maker space

First session of prototyping

11) Prototyping #2 @ Maker space

Second session of prototyping

12) Prototyping #3 @ Maker space

Third session of prototyping

13) Final presentation and show-casing

The course participants will present their prototype to the other groups, and the prototypes will be exposed to all the ESP students, program staff and visitors – including during the closing ceremony and garden party.

Learning Outcomes:

By the end of the course, the students should be able to:

- Apply a four-step strategic planning process for cities :
    - Identify socio-ecological impacts in the current city operations,
    - Create a list of potential measures (recommendations and strategic guidelines, good practices, eco-innovations, new business models for public services, etc.),
    - Set priorities and create an action plan,
    - Produce a physical prototype of the recommended solution and present it (pitch + showcase) : sensor, 3D printed objects, model, or other physical artifacts (according to the course participants technical backgrounds and capabilities).
- Understand specific European city cases through study visits

WORKLOAD

French contact hours = 60 minutes (in some countries/institutions, 1 contact hour = 45-50 minutes)

Form:	**Number of hours**	**Comments**
In-class highly participative sessions (content presentation + workshops)	18 hours	
Study visits, and other activities “in the field”	12 hours	4 sessions of 3 hours - including visits to local companies and institutions involved in urban-planning for sustainable development
Activities at the FabLab	9 hours	Fabrication Laboratory
Approximate personal work / homework	10 hours	
Student total workload	49 hours	

EDUCATIONAL METHODS

Students are encouraged to become familiar with sustainability through their own reading and research. They will fully prepare in advance for the classes, thereby maximising classroom time. Active student involvement of the learning of the themes studied is expected. Common features of the classes will include:

- Reading of prescribed essays and articles
- Discussions/debates
- Short presentations
- Review of case studies
- Research on internet to further knowledge of the topics

RESOURCES

All course materials will be supplied in class. References may be made to the following resources:

Essays

Benyus, Janine 1998. *Biomimicry: Innovation Inspired By Nature.*

Bertaud, Alain 2018 *Order without Design: How Markets Shape Cities*, The MIT Press

Dassen, Ton (Editor) and Hajer M. (Contributor) 2015 *Smart about Cities: Visualising the Challenge for 21st Century Urbanism* Paperback, nai010 publishers

Elkin, Lauren 2016 *Flâneuse: Women Walk the City in Paris, New York, Tokyo, Venice, and London,* Chatto & Windus

Florida, Richard 2017 *The New Urban Crisis: How our Cities are Increasing Inequality, Deepening Segregation, and Failing the Middle Class — and What We Can Do about It*, Basic Books

Hamilton, Marilyn 2008 *Integral City: Evolutionary Intelligences for the Human Hive*, New Society Publishers

Harari, Yuval Noah 2014 *Sapiens: A Brief History of Humankind*, Harper

Hawkens, Paul 2018 *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming*, Penguin Books

McFarlane, Colin and Graham S. (Editors) 2014 *Infrastructural Lives: Urban Infrastructure in Context,* Routledge

McLaren, Duncan and Agyeman J. 2015 *Sharing Cities: A Case for Truly Smart and Sustainable Cities*, MIT Press

Montgomery, Charles 2013 *Happy City: Transforming Our Lives Through Urban Design*, Penguin Books

Rifkin, Jeremy 2012. *The Third Industrial Revolution: How the Internet, Green Electricity, and 3-D Printing are Ushering in a Sustainable Era of Distributed Capitalism*

Rifkin, Jeremy 2014. *The Zero Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism*. Palgrave Macmillan Trade.

Rose, Jonathan 2016 *The well tempered city: What Modern Science, Ancient Civilizations, and Human Nature Teach Us About the Future of Urban Life*, Harper Wave

Sadik, Janette 2018 *Streetfight: Handbook for an Urban Revolution*, Viking

Saunders, Doug 2011 *Arrival City: The Final Migration and Our Next World*, Windmill Books

Schumacher, E. 1973. *Small Is Beautiful*. London: Blond & Brig gs Ltd.

Therborn, Goran 2017 *Cities of Power: The Urban, The National, The Popular, The Global*, Verso

Utopies 2018 *Fabcity : Toward productive cities*

Other articles

Glavas, Ante, Senge P. and Cooperrider D. 2010 *Building a Green City on a Blue Lake : A Model for Building a Local Sustainable Economy*

Kirsch, Vanessa, Bildner J. and Walker J. 2016 *Why Social Ventures Need Systems Thinking* Harvard Business Review

Senge, PM and Carstedt, G. 2001. *Innovating our way to the next industrial revolution*. MIT Sloan Management Review 42(2): 24-38.

Sustainability Illustrated 2014. *Cats in Borneo* (article and video) https://goo.gl/sN9SwA

Young, Eric 2007 *The Magic Canoe. Opening Remarks: City Summit Alliance*

Guidebooks

Bateson, Nora 2018 *The Warm Data booklet*

The Natural Step Canada 2009 *Sustainability Primer*

The Natural Step Canada 2009 *Integrated Community Sustainability Planning Guide*

Videos

Andreas Dalsgaard and Simon Lereng *Human scale city* (trailer) http://thehumanscale.dk/

Indy Johar 2018 Social innovation - From Grassroot to System Change" - keynote at SISummit https://www.youtube.com/watch?v=flj_CrNUoIY

Janette Sadik-Khan *New York's streets? Not so mean any more* (NYC Tactical urbanism) https://www.ted.com/talks/janette_sadik_khan_new_york_s_streets_not_so_mean_any_more

Jason Roberts *How to build a better block* (Dallas, Texas) http://www.youtube.com/watch?v=ntwqVDzdqAU

James Howard Kunstler *The ghastly tragedy of the suburbs* https://www.ted.com/talks/james_howard_kunstler_the_ghastly_tragedy_of_the_suburbs

ASSESSMENT

Form	Number	Duration	Comments
Continuous assessment (60%)	2	2 x 10 minutes, 1 x 15 minutes	Two intermediary presentations, One final presentation
Final exam (20%)	1		Group case study
Others (student participation…) (20%)			Attendance, participation, and contribution to group discussion

This syllabus is based on information available at the time of publication (November 2021). Changes may occur.

For updated information about course content, please contact us: esp@univ-catholille.fr