ES/SO360 SUSTAINABLE WORLD AND PRODUCTION: RETHINKING THE CITY
IES Abroad Freiburg, London, Milan

DESCRIPTION:

“All the biggest problems that we face now (...) like global climate change or the pandemic, require collaborative efforts, not just the multiplication of the same sort of person a million times over.” Peter Galison

Cities are not only where most of the world’s population now lives, they also use 78% of the world’s resources and produce more than 60% of greenhouse gas emissions. At the same time, innovating cities around the world are leading the way in responding to the crises of climate change and resource depletion by developing models for sustainable, resilient, equitable living. Experience has shown that cities are more successful in achieving their goals when they cooperate with each other, working together, and learning from each other. In this course, students will be asked to identify the most pressing sustainability issues in your host city. Working in small teams, they will design a new housing community that can offer solutions to the issues they have identified at the local level, taking into account the environmental, historical and social characteristics of their host city. Fellow students will be from the IES Abroad London, Freiburg and Milan Centers and will represent a variety of academic backgrounds. Together, they will be part of a greater learning community, guided by faculty experts from diverse backgrounds, working towards solutions to the identified problems. Substantive field visits and connections with local NGOs will allow students to gather valuable data and information as they develop their projects; innovative technology will enable them to share their experience and findings across the three locations; and problem-based learning will culminate in each team delivering a multi-media presentation to the group. Upon successful completion of this course, students will earn a micro-credential in Sustainability and Development that will demonstrate their sustainability literacy and ability to find innovative solutions to complex problems.

CREDITS: 3

CONTACT HOURS: 45

LANGUAGE OF INSTRUCTION: English

PREREQUISITES: None

ADDITIONAL COST: None

METHOD OF PRESENTATION:
The central focus of this course is the challenge given to each of the three teams, to design a sustainable housing community aimed at tackling the sustainability problems identified in the students’ host cities. The methods of presentation are designed to support the students in this challenge. The following approaches will be used:

- Classes: will be held both synchronously, across the participating centers with video links, and on-site in each location.
- Video lectures: the faculty will present key concepts from different disciplinary perspectives to explore the interconnectivity between them. These lectures will be available on the Moodle site.
- Team presentations: every two weeks, each team will give a short presentation to the other teams on their work on the assignments. Students will be expected to give feedback to the other teams.
- Moodle forums: before the synchronous classes, teams will outline their approach to the questions assigned on a Moodle forum, where they will be asked to comment on the other teams’ work and give feedback and suggestions.
- Class discussion: the course will follow a flipped classroom approach, in which teaching will occur outside class time, and classes will be devoted to discussions and presentations.

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1 Peter Galison, founder of The Black Hole Initiative at Harvard University, in “Stranger than anything dreamed up by sci-fi: will we ever understand black holes?” The Guardian, 26 May, 2021
Materials in Moodle: key readings, videos and online resources designed to develop a general understanding of the subject matter and foment discussion.

Course-related trips: students will use these trips to inspire their designs and give them a chance to receive feedback from experts in the field. Teams will document the trips along with the faculty so they can share them with the other teams. These trips will be concentrated in three ‘Super Fridays’ in the second half of the course.

REQUIRED WORK AND FORM OF ASSESSMENT:

- Participation – 20%
- Team assignments – 50% (10% per assignment)
- Team projects – 20%
- Field visit summaries – 10%

Participation
Participation is essential in this course. Students are required to engage with assigned materials, and to participate actively both in their team activities and in their discussions with other teams. A general participation rubric will be shared with students.

Students will be asked to reflect on their levels of sustainability awareness and engagement by completing a questionnaire at the beginning, middle and end of the course.

Team assignments
Each team will be given a total of five assignments during the semester. Each assignment will require examining a situation, and suggesting a solution, in line with instructions given. The first assignment will be related to general sustainability issues. The following four assignments will be directly related to the final project. Rubrics will be provided to guide the students in completing their assignments, although the rubrics will leave space for originality and creativity. Grading will be done on the basis of the clarity and creativity of solutions, but also on the basis of the teams’ ability to work together, and to exchange ideas. Collaboration, and adapting other teams’ ideas to the local context will be positively evaluated.

Team projects
The teams in each location will be charged with identifying the key sustainability issues in their host city, and designing a sustainable housing community to tackle those problems. Four of the five assignments given during the semester are intended to help students tackle a part of the design, and teams will present reports on their responses to these assignments throughout the semester. At the end of the course, each team will deliver a multi-media presentation on their final design. Each project will be guided by the three faculty in a staged fashion, and each team will receive feedback from their peers. A rubric will be provided for the evaluation of the biweekly reports and final project.

Summaries of field visits
One-page summaries of field visits and guest speakers for other teams.

Journals
Each team will keep a journal outlining the process of tackling the issues, highlighting the problems they encounter, with materials, team dynamics, meeting outside experts, and how they solved these problems. A rubric will be provided.

LEARNING OUTCOMES:
By the end of the course students will be able to:

- Identify the key sustainability issues in a determined location
- Compare and critique sustainability policies in different locations
- Learn from the problem-solving experiences of people working in other locations
- Recognize and explain the complexity and interrelatedness of sustainability challenges
- Present their ideas to policy makers and sustainability experts in a range of fields and integrate these experts’ advice into their designs
- Work collaboratively with international teams
• Differentiate between realistic and unrealistic goals for sustainability solutions
• Analyze the successes and failures of sustainability initiatives in other locations

ATTENDANCE POLICY:
Attendance is mandatory for all IES Abroad classes, including course-related excursions. Any exams, tests, presentations, or other work missed due to student absences can only be rescheduled in cases of documented medical or family emergencies. If a student misses more than three classes in any course 3 percentage points will be deducted from the final grade for every additional absence. Seven absences in any course will result in a failing grade.

COURSE AND CLASS STRUCTURE:
The course will be 10 weeks long and will consist of two sections:

• Section 1: for the first 4 weeks, the course will be fully online. Students will receive a grounding in key interdisciplinary topics related to cities and sustainability from the four faculty, to give them a solid foundation to work on for the rest of the course. Additionally, students will work with the teams at the other centers to practice problem solving skills and identify the main sustainability issues in each location.

• Section 2: the last 6 weeks of the course will be a mix of online and face-to-face interactions, and the teams will develop their designs following a structured process.

In Section 1, students will engage with the class materials, and will engage with each other in Moodle forums, and will meet in online synchronous classes with the different faculty to discuss the key topics each week.

In Section 2, students will continue to engage with class materials online, and meet on Moodle forums. They will also meet for two class sessions each week, the first one on site, with the other students and faculty in the same center, and the second online, with all the students and faculty, via video conference. There will be an additional online synchronous meeting in the last week, in which each team will present its multi-media project.

CONTENT:

<table>
<thead>
<tr>
<th>Week</th>
<th>Content</th>
<th>Assignments and Readings</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to the course</td>
<td>• Berners-Lee, M., 2010, How Bad are Bananas, The Carbon Footprint of Everything, Green Profile, pp 7-14, 28-29, 32-33, 145-148</td>
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<tr>
<td><strong>1</strong></td>
<td><strong>Group presentation on the historical climate and sustainability challenges of your host city</strong>&lt;br&gt;<strong>First assignment given: analyze the relative sustainability of two common objects</strong></td>
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<td><strong>2</strong></td>
<td><strong>What is sustainability, and what is climate change? A scientific ecosystem perspective.</strong>&lt;br&gt;<strong>McKay, David J.C., 2009, Sustainable Energy Without the Hot Air, UIT, Cambridge, Chapter 15, “Stuff”, available: <a href="https://www.withouthotair.com/c15/page_88.shtml">https://www.withouthotair.com/c15/page_88.shtml</a></strong>&lt;br&gt;<strong>Fedkin, Mark V., “Sustainability, Definitions”, in Technologies for Sustainable Systems, Department of Energy and Mineral Engineering, PSU, available: <a href="https://www.e-education.psu.edu/eme807/node/575">https://www.e-education.psu.edu/eme807/node/575</a></strong>&lt;br&gt;<strong>Frey, Wolfgang, 2011, Freiburg Green City, “Thoughts On Sustainability” pp. 10-29 Herder Verlag</strong>&lt;br&gt;<strong>Chaplin et al, 2002, Principles of Terrestrial Ecosystem Ecology, Springer Verlag. ‘The ecosystem concept’, pp 3-13; ‘Human Caused Changes in Earth’s Ecosystem’, pp 13-17; Landform effects on climate, pp 31-32; Vegetation influences on climate, pp 32-34</strong>&lt;br&gt;<strong>Creating a joint definition of sustainability and climate change</strong>&lt;br&gt;<strong>How to evaluate sustainability</strong>&lt;br&gt;<strong>Ecosystems and ecological concepts of sustainability</strong>&lt;br&gt;<strong>The basic science of climate change</strong>&lt;br&gt;<strong>Short presentations by teams on their solutions to the first assignment</strong>&lt;br&gt;<strong>Guided discussion of results of exercise</strong>&lt;br&gt;<strong>Production of joint definition of sustainability and climate change</strong>&lt;br&gt;<strong>Second assignment given: how sustainable is your home town?</strong>&lt;br&gt;<strong>Recorded lecture: &quot;Brief introduction to the earth’s climate system and its changes over time&quot;</strong></td>
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4 Culture, ideology and climate change: how we can adapt, and what we can learn from each other

- Collection and presentation of best practices


- The impact of culture on climate change and of climate change on culture
- Cultural rights and traditional knowledge
- How to change people’s ideologies and worldviews, and how to learn from others

- Group online discussion on beliefs, values and climate change
- Teams present results of second assignment
- Third assignment given: what are the principal sustainability challenges of your host city?

SECTION 2

5 Why? Part I


- Identifying the principal resources – food, energy, housing, transport – that students use on a daily basis

- Teams work on storyboards of their everyday lives, identifying how they interact with the world, and identifying the principal resources they use
- Teams work with faculty to identify sources to help them assess the sustainability credentials of these resources

6 Why? Part II
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<tr>
<td><strong>7</strong></td>
<td><strong>What? Part I</strong></td>
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<td>• Researching the sustainability credentials of the resources used</td>
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<td>• Teams search for data on sustainability indices in their host cities – carbon emissions, house-price affordability, public vs private transport, energy sources, resource footprints</td>
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<td>• Teams present findings for their third assignment</td>
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<td>• Identifying the main features of the proposed housing community: housing model, building materials, location, density, energy supply, waste management, transport links</td>
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<td>• Fourth assignment given: Identify the main features of your proposed housing community</td>
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<td><strong>8</strong></td>
<td><strong>What? Part II</strong></td>
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<td></td>
<td>• Identifying the main features of the proposed housing community: housing model, building materials, location, density, energy supply, waste management, transport links</td>
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<td>• Teams present results of their fourth assignment</td>
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<td><strong>9</strong></td>
<td><strong>Who? Part I</strong></td>
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<tr>
<td></td>
<td>• Researching justifications for proposed features of housing community. Strengths and weaknesses of model adopted. Justification within local context</td>
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<td></td>
<td>• Diversity.social, <em>Social Sustainability, Everything You Need to Know</em>. Available: <a href="https://diversity.social/social-sustainability/">https://diversity.social/social-sustainability/</a></td>
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<tr>
<td></td>
<td>• The social fabric of the housing community; who will it be designed for?</td>
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<td>• Issues of accessibility, inclusivity, equity, affordability</td>
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<td>• How will you finance the project? What impact will this have on its long term viability?</td>
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Course conclusions

- Students present their solutions to the fifth challenge.
- Students present their final projects to the whole class.

COURSE-RELATED TRIPS:
Students will attend visits to a range of sustainability-related projects in each location, as well as visiting experts in different fields. Some of the trips will be designed before the semester starts, whereas others will be recommended by faculty in response to the development of the local team’s research.

At the start of the program, students will be given guided and self-guided tours of their host cities, designed to introduce them to the key sustainability issues and concerns in the local context.

Super Fridays
While there will be flexibility for course-related trips and guest speakers at other times, two Fridays will be set aside during the semester to concentrate the course-related trips and guest speakers, in order to be able to take maximum advantage of visits and activities that require more time than normally available during the week. The students will take notes during the Super Fridays and will report back to the other teams on their experiences. The basic structure of the Super Fridays will be as follows:
- Morning and early afternoon: course related excursions and guest speakers in each location
- Afternoon: full, synchronous meeting. Report by teams on their visits, including short videos. Discussion about utility of visits, recommendations, and key learning items.

REQUIRED READINGS:
- Diversity.social, *Social Sustainability, Everything You Need to Know*. Available: [https://diversity.social/social-sustainability/](https://diversity.social/social-sustainability/)
- Frey, Wolfgang, 2011, *Freiburg Green City*, “Thoughts On Sustainability” pp. 10-29 Herder Verlag
RECOMMENDED READINGS:

This is a list of readings recommended by the faculty which students can draw on during the semester to help them tackle issues or questions that arise during their research. The faculty team will also recommend additional other readings and materials throughout the semester, adapting to the direction that the teams’ research is taking.


- Deutscher Forstwirtschaftsrat e.V., from Grober, Ulrich, 2012, *Sustainability — a cultural history* Green Books, available: https://www.forstwirtschaft‐in‐deutschland.de/index.php?id=50&L=1, see the following tabs: “German forestry” and the 2 short chapters "Sustainability" and "Boundaries of Sustainability"
- DMA Europa, *WEG helps to generate hydro‐electricity for Windsor Castle*, available: https://www.youtube.com/watch?v=wG‐TBJC1R4c
- Spanner Re2 GmbH, *Wood gasifier at Scotston Farm – Biomass Power Plant*, available: https://www.youtube.com/watch?v=i9xmWJ4hAGs
- The B1M Limited, *3 Cool Ways to Cool Our Cities*, available: https://www.youtube.com/watch?v=V4Y7VVVD68 (8min.)
- Wirth, H., *Recent facts about photovoltaics in Germany*, Fraunhofer Institute ISE, ch. 2 and 3 (pp 5-6), ch. 13 and 14 (pp 38-43)