



ES/SO360 DESIGNING THE SUSTAINABLE CITY – GLOBAL PILLARS COURSE

IES Abroad Multi-Location

DESCRIPTION:

IES Abroad's Global Pillars – Sustainable Living, Equitable Living, Human Wellbeing – integrate most of the UN Sustainable Development Goals (SDG's). The Global Pillars courses use the pillars as a reference framework, adopt a problem-based learning methodology, and build a multidisciplinary learning community. *Designing the Sustainable City* integrates all three Global Pillars.

"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 Galison¹

Cities are not only the engine of economic growth and 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. Increased urbanization, in line with other global transformations such as climate change and migration, requires innovative urban development that takes ecological, social and economic factors into account. Cities are increasingly expanding on agricultural land and valuable ecosystems, and have become more vulnerable to natural and man-made disasters. Experience has shown that when cities are considered as "linked social-ecological-technological systems", initiatives are more successful since they foster collaboration across temporal, social and ecological scales as well as intersectoral and integrated resource management.

This course aims at fostering a cross-institutional and multidisciplinary learning environment, by connecting students from the three IES Abroad centers in Nice, Berlin and Barcelona. Fellow students will not only benefit from the expertise of faculties from a variety of academic backgrounds, but also learn about sustainability challenges and policies in different cities around the world. Through problem-based learning, students will be able to apply global norms such as the SDGs and assessment tools to local urban challenges. Students will be asked to identify the most pressing sustainability challenges in their host city and observe how it relates to other realities. Working in small teams, they will develop an innovative project proposal that can offer solutions to the identified challenge, taking into account the environmental, economic, historical and social characteristics of their host city. With the students from the other centers, they will be part of a greater learning community, guided by faculty experts from diverse backgrounds, working to address these challenges.

Substantive field visits and connections with local stakeholders, such as grassroots initiatives, start-ups or public institutions, 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 different locations; and problem-based learning will culminate in each team delivering a multimedia presentation to the group. Upon successful completion of this course, students will earn a micro-credential in Sustainability and project development that will demonstrate their sustainability literacy and ability to find innovative solutions to complex problems.

CREDITS: 3 credits

CONTACT HOURS: 45 hours

LANGUAGE OF INSTRUCTION: English

PREREQUISITES: None

ADDITIONAL COST: None

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

METHOD OF PRESENTATION:

The main outcome of this course is the challenge given to each of the three teams to design a project proposal 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 synchronously both online and F2f, across the participating centers with video links, and on-site in each location.
- **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.
- **Group presentations:** student groups will give short presentations to the other groups on their work on the assignments. Students will be expected to give feedback to the other groups.
- **Assignments and mid-term evaluation:** students will work in a total of 8 assignments. These assignments are designed to build upon each other as milestones. For the mid-term evaluation, students will present the first stage of their project proposal, defining the sustainability challenge in their host city to be addressed in more depth.
- **Project proposal:** groups will develop a project proposal designed to improve social, environmental and economic sustainability in their host city. Students will have to develop relevant, feasible, context-specific and innovative solutions.
- **Online activities:** groups will outline their work in the Miro board, where they will be asked to comment and give feedback on the other groups'.
- **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.
- **Materials in Moodle:** key readings, videos and online resources designed to develop a general understanding of the subject matter and trigger discussion.
- **Course-related trips:** student participation in the course-related trips is mandatory. Students will use these trips to inspire their project proposals and give them a chance to receive feedback from experts in the field. Groups will document the trips so they can share their insights and learnings with the other groups. Some longer course-related trips can be held on Fridays and specific dates will be given at the beginning of the course.

REQUIRED WORK AND FORM OF ASSESSMENT:

- Participation – 20%
- Assignments – 70%
 - Regular assignments – 35%
 - Introducing your host city to the class: How do people and nature interact? - 5%
 - Ecological Footprint Storyboard - 10%
 - How socially sustainable and equitable is your host city? - 10%
 - SWOT analysis - assessing sustainability with an integrated scope (economic, social, environmental and institutional) - 10%
 - Project proposal development – 35%
 - Defining the challenge to be addressed - 15%
 - First report
 - Poster presentation: highlights of the challenge and its context
 - Written proposal - 10%
 - Final presentation - 10%
- Course-related trips photos & summaries – 10%

Course Element

- **Participation:** Participation is essential in this course. Students are required to study assigned materials and to participate actively both in their group activities and in their discussions with other groups. A general participation rubric will be shared with students at the beginning of the course.
- **Group Assignments:** Assignments will work as progress milestones guided by the faculty. Students will work as a group to complete the project related assignments and activities during the semester. Each student should equally contribute to the

groups' project and this will be reflected in the individual grades. The starting point will be a comparative analysis of the sustainability of the host cities. The second step will consist of identifying a key sustainability challenge in their host city, and designing a project to tackle those challenges. At the end of the course, each group will deliver a multimedia presentation on their final project proposal. Each group will receive feedback from their peers and from the instructors. Rubrics will be provided to guide the students in completing their assignments, leaving also space for originality and creativity. Grades will be awarded on the basis of individual and group contributions, the clarity and creativity of solutions tailored to the local context, but also on the groups' ability to work together, and to exchange ideas.

- **Summaries of course-related trips:** Summaries of course-related trips and guest speakers will be shared with other groups in class and on the Miro board.

LEARNING OUTCOMES:

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

- Recognize and explain the complexity and linkages of sustainability challenges at different scales and contexts
- Learn to analyze these challenges in an integrated way incorporating the ecological, social and economic dimensions
- Identify the key sustainability and social equality challenges in a determined location
- Compare and critique sustainability policies in different locations
- Learn from the problem-solving experiences of people working in other locations
- Use of different tools and methods in project planning and design
- Differentiate what makes sustainability solutions feasible or not
- Present and communicate ideas to a broader audience within the IES Community and beyond
- Work collaboratively with international teams
- Analyze the successes and failures of sustainability initiatives in other locations

ATTENDANCE POLICY:

As a member of our class community, you are expected to be present and on time every day. Attending both online and regular classes, has an impact on your learning and academic success. For this reason, attendance is required for all IES Barcelona, Berlin and Nice classes, including course-related trips. If a student misses more than three classes in any course without justification, 3 percentage points will be deducted from the final grade for every additional absence. Seven unjustified absences in any course will result in a failing grade. Absences will only be justified, and assessed work, including exams, tests and presentations rescheduled, in cases of documented medical or family emergencies.

CONTENT:

Week	Content	Assignments
Week 1	Introduction to the course Get familiar with course structure, learning tools and dynamics Learn the basics of sustainability and the SDG's framework	Watch: Urban Geography: Why We Live Where We Do Watch: Miro 101: Collaborating on a Board Watch: What is ArcGIS StoryMaps? Read: United Nations, Department of Economic and Social Affairs, <i>Sustainable Development Goals</i>, available: https://sdgs.un.org/goals Chaplin et al, 2002, <i>Principles of Terrestrial Ecosystem Ecology</i>, 'The ecosystem concept', pp 3-13, 'Human Caused Changes in Earth's Ecosystem', pp 13-17, Springer Verlag

Week	Content	Assignments
Week 2	Reconnecting urban citizens to and through nature: Cities as champions of sustainability? Cities in the Anthropocene: Urban systems, global environmental change, resilience and sustainability.	WATCH: Christine Alfson's TEDxSciencesPo talk, "Reconnecting people to and through their natural environment": https://youtu.be/H51VsyCDARe. LISTEN: SDG 11 - Sustainable Cities and Communities. UN Sustainable Development Goals: https://youtu.be/BKizTCNgq5Q READ: Krueger, E.H., Constantino, S.M., Centeno, M.A. et al. Governing sustainable transformations of urban social-ecological-technological systems. npj Urban Sustain 2, 10 (2022). https://doi.org/10.1038/s42949-022-00053-1 Borgström, S. T., T. Elmqvist, P. Angelstam, and C. Alfson-Norodom. 2006. Scale mismatches in management of urban landscapes. Ecology and Society 11(2): 16. [online]URL:http://www.ecologyandsociety.org/vol11/iss2/art16 https://www.researchgate.net/publication/234079254_Scale_Mismatches_in_Management_of_Urban Ernstson, H., van der Leeuw, S.E., Redman, C.L. et al. Urban Transitions: On Urban Resilience and Human-Dominated Ecosystems. AMBIO 39, 531–545 (2010). https://doi.org/10.1007/s13280-010-0081-9
Week 3	Social dimension of sustainability, intersectionality and climate justice How socially sustainable and equitable is your host city?	Read: Eizenberg, Efrat, and Yosef Jabareen, 2017, "Social Sustainability: A New Conceptual Framework" Sustainability 9, no. 1: 68. Sustainability Free Full-Text Social Sustainability: A New Conceptual Framework (mdpi.com) Watch: What is Intersectionality? https://www.youtube.com/watch?v=cNEDS5BP_C8 Listen: The Cities of Refuge Podcast S1E15: Human rights in urban debates on migration and diversity https://podcasts.apple.com/de/podcast/s1e15-human-rights-in-urban-debates-on-migration-and/id1543987084?i=1000527840257
Week 4	The role of economy: profit in running towards urban sustainability. SWOT analysis - assessing urban sustainability with an integrated scope (economic, social, environmental and institutional)	Read: Ellen MacArthur Foundation, 2017, <i>Cities in the Circular Economy: An initial exploration</i>, Available online at: https://emf.thirdlight.com/link/6geje0hxi9n1-2aoa77/@/preview/1?o Watch: Ellen MacArthur - Learning & The Circular Economy Listen: Podcast "The Circular Economy Show". Ep 44: <i>Building thriving cities fit for the 21st century</i> https://ellenmacarthurfoundation.org/podcasts/podcast-building-thriving-cities-fit-for-the-21st-century

Week	Content	Assignments
Week 5	Defining the challenge. Fleas in a seesaw: From navigating urban change to designing sustainable cities Basic elements for project proposal development What problems around urban sustainability can we identify in each host city? Which of these catches the group's interests? How do the different disciplines from the group's members address this problem?	Read: James, Paul, Liam Magee, Andy Scerri, Manfred Steger, 2015, <i>Urban sustainability in theory and practice: circles of sustainability</i> , New York: Routledge, Chapters 1 and 2, pp 3-37, available at: (6) Urban Sustainability in Theory and Practice: Circles of Sustainability (2015) Paul James, Andy Scerri, and Liam Magee - Academia.edu
Week 6	Identifying solutions Problem tree and Reverse brainstorming Conduct research for: Defining the local context and how it relates to the selected challenge. Identify best practices and examples on how to address the identified challenge.	Read: Chelleri L. and Olazabal M. (eds.) 2012. <i>Multidisciplinary perspectives on urban resilience: a workshop report</i> , Bilbao: Basque Centre for Climate Change, Chapter 1, "Why Urban Resilience?", pp 7-19, available for download: https://www.urbanresilienceresearch.net/2016/02/04/our-first-book-on-urban-resilience-available-online/
Week 7	Developing the project proposal I Poster presentations Identify highlights and opportunity areas	Read: Fedkin, Mark V., "Sustainability, Definitions", in <i>Technologies for Sustainable Systems</i> , Department of Energy and Mineral Engineering, PSU, available: https://www.e-education.psu.edu/eme807/node/575
Week 8	Developing the project proposal II Theory of change 1: Stakeholders Map Identify and map the input of the involved stakeholders	Read: Rikke Friis Dam; Teo Yu Siang. <i>Stakeholder Mapping: The Complete Guide to Stakeholder Maps</i> . 2022. Available online at: https://www.interaction-design.org/literature/article/map-the-stakeholders
Week 9	Focus Theory of change 2 Which elements of the local context that can enhance/hinder success?	Read: Patricia Rogers, 2014, "Theory of Change", <i>Methodological Briefs—Impact Evaluation No. 2</i> , UNICEF Office of Research, Florence. Available online at: brief_2_theoryofchange_eng.pdf (unicef-irc.org)
Week 10	Final presentations and Course conclusions	Group interview Final presentation

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 group'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. Some of the longer trips will be scheduled on Fridays. Students will be informed of the dates of Friday trips at the beginning of the semester.

COURSE AND CLASS STRUCTURE

The course will be 10 weeks long, each week consisting of an online session and an onsite (F2f) session. The format of the class is indicated in the class calendar and in Moodle. The course will have two three-hour slots per week, scheduled at the same time in all three participating centers. These two blocks of time will be used to cover the following:

1. Three contact hours per week, in online and/or onsite format.
2. Field visits in the city (occasionally on Fridays).
3. Three hours per week for group work on assignments (cross-center and inter-center).

REQUIRED READINGS:

- Borgström, S. T., T. Elmqvist, P. Angelstam, and C. Alfsen-Norodom. 2006. Scale mismatches in management of urban landscapes. *Ecology and Society* 11(2): 16. [online]URL:<http://www.ecologyandsociety.org/vol11/iss2/art16>
https://www.researchgate.net/publication/234079254_Scale_Mismatches_in_Management_of_Urban
- Chaplin et al, 2002, *Principles of Terrestrial Ecosystem Ecology*, 'The ecosystem concept', pp 3-13, 'Human Caused Changes in Earth's Ecosystem', pp 13-17, Springer Verlag
- Chelleri L. and Olazabal M. (eds.) 2012. *Multidisciplinary perspectives on urban resilience: a workshop report*, Bilbao: Basque Centre for Climate Change, Chapter 1, "Why Urban Resilience?", pp 7-19, available for download:
<https://www.urbanresilienceresearch.net/2016/02/04/our-first-book-on-urban-resilience-available-online/>
- Diversity.social, *Social Sustainability, Everything You Need to Know*. Available: <https://diversity.social/social-sustainability/>
- Eizenberg, Efrat, and Yosef Jabareen, 2017, "Social Sustainability: A New Conceptual Framework" *Sustainability* 9, no. 1: 68. [Sustainability | Free Full-Text | Social Sustainability: A New Conceptual Framework \(mdpi.com\)](https://www.mdpi.com/2076-3433/9/1/68)
- Ellen MacArthur Foundation, 201, *Cities in the Circular Economy: An initial exploration*, Available online at:
<https://emf.thirdlight.com/link/6geje0hxi9n1-2aoa77/@/preview/1?o>
- Ernstson, H., van der Leeuw, S.E., Redman, C.L. et al. Urban Transitions: On Urban Resilience and Human-Dominated Ecosystems. *AMBIO* 39, 531–545
- (2010). <https://doi.org/10.1007/s13280-010-0081-9>
- Fedkin, Mark V., "Sustainability, Definitions", in *Technologies for Sustainable Systems*, Department of Energy and Mineral Engineering, PSU, available: <https://www.e-education.psu.edu/eme807/node/575>
- James, Paul, Liam Magee, Andy Scerri, Manfred Steger, 2015, *Urban sustainability in theory and practice: circles of sustainability*, New York: Routledge, Chapters 1 and 2, pp 3-37, available:
https://www.academia.edu/9294719/Urban_Sustainability_in_Theory_and_Practice_Circles_of_Sustainability_2015
- Krueger, E.H., Constantino, S.M., Centeno, M.A. et al. Governing sustainable transformations of urban social-ecological-technological systems. *npj Urban Sustain* 2, 10 (2022). <https://doi.org/10.1038/s42949-022-00053-1>
- McKay, David J.C., 2009, *Sustainable Energy Without the Hot Air*, UIT, Cambridge, Chapter 15, "Stuff", available:
https://www.withouthotair.com/c15/page_88.shtml
- Patricia Rogers, 2014, "Theory of Change", *Methodological Briefs—Impact Evaluation No. 2*, UNICEF Office of Research, Florence. [brief_2_theoryofchange_eng.pdf \(unicef-irc.org\)](https://www.unicef-irc.org/publications/pdf/brief_2_theoryofchange_eng.pdf)
- Stevens, Jess, 2020, "Urban Forests: Nature as a Resource", *Biophillic Cities/Law and Policy*, Vol 3, No 2, available:
<https://static1.squarespace.com/static/5bbd32d6e6669016a6af7e2/t/5eff40c2f00dfd0e1790aab0/1593786570683/Urban+Forest+Law+and+Policy.pdf>
- United Nations, Department of Economic and Social Affairs, *Sustainable Development Goals*, available:
<https://sdgs.un.org/goals>
- Zivarts, Anna, "The '15-Minute-City' isn't made for disabled bodies", *Bloomberg CityLab*, April 2021, available:
<https://www.bloomberg.com/news/articles/2021-04-22/the-people-that-the-15-minute-city-leave-behind>

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.

- Berners-Lee, M., 2010, *How Bad are Bananas, The Carbon Footprint of Everything*, Green Profile, pp7-14, 28-29, 32-33, 145-148
- Brown, L. R. (2009) "Designing Cities for People", In *Plan B 4.0: Mobilizing to Save Civilization*, Norton, W. W. & Company, Inc. (Ch. 6, p.143-167). a: http://www.earthpolicy.org/images/uploads/book_files/pb4ch06.pdf
- Brown, L. R. (2009), "Can We Mobilize Fast Enough?" In *Plan B 4.0: Mobilizing to Save Civilization*, Norton, W. W. & Company, Inc. (Ch. 10, p.143-167). available: http://www.earthpolicy.org/images/uploads/book_files/pb4ch10.pdf
- Eurostat, *Sustainable Development in the European union: Overview of Progress towards the SDGs in an EU context*, available: <https://ec.europa.eu/eurostat/documents/4031688/11010788/KS-01-20-192-EN-N.pdf/ae63aff0-a6f3-1d47-da83-c6886b9daaab?t=1592486268000>
- United Nations, Department of Economic and Social Affairs, *Sustainable Development Goals*, available: <https://sdgs.un.org/goals>
- Bowerman, T., 2014, "How much is too much? A public opinion research perspective" *Sustainability: Science, Practice, & Policy*. Volume 10, Issue 1, p.1-15. Available online at: http://sspp.proquest.com/static_content/vol10iss1/1209-044.bowerman.pdf
- 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>
- Ellen MacArthur Foundation, 2012, *Towards the Circular Economy Vol. 1: "An economic and business rationale for an accelerated transition"*, Available online at: <https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf>
- Fournier, V, 2008, "Escaping from the economy: the politics of degrowth", *International Journal of Sociology and Social Policy*, Vol. 28 No. 11/12, (pp. 528-545). Available online at: http://www.web.ca/~bthomson/degrowth/fournier_the_politics_of_degrowth_13mar08.pdf
- Freiburg Town Hall, *Environmental and Climate Protection in Freiburg*, Chapter 1.4, pages 27-33, available: https://greencity.freiburg.de/pb/site/freiburg_greencity/get/params_E1778569723/1693283/environmental%20and%20climate%20protection%20in%20Freiburg.pdf
- International Institute for Sustainable Development, *Sustainable Development*, available: <https://www.iisd.org/about-iisd/sustainable-development>
- Green City Times, *Green City: Europe's solar city, Freiburg*, 4 pages, available: <https://www.greencitytimes.com/freiburg/>
- Hoornweg, Daniel; Bhada-Tata, Perinaz, 2012. "What a Waste : A Global Review of Solid Waste Management" *Urban development series;knowledge papers no. 15*. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/17388>
- Smil, Vaclav, 2017, *Energy and Civilization*, Cambridge: MIT Press, ch 6, "Fossil-fuelled Civilization", pp 295-381
- 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=V4Y7VYVVD68> (8min.)
- Umwelt Bundesamt, 2019, *Rebound effects*, available: <https://www.umweltbundesamt.de/en/topics/waste-resources/economic-legal-dimensions-of-resource-conservation/rebound-effects>
- US department of agriculture: *Sustainability*, pp 1-3 (Introduction plus 'Planning Rule Requirements'), page 9 (chapter 'Describe the ecological context'), available: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5130669.pdf
- 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)
- WWAP (United Nations World Water Assessment Programme)/UN-Water. 2018. *The United Nations World Water Development Report 2018: Nature-Based Solutions for Water*. (P. 21-36 and 79-87) Paris, UNESCO. Available online at: <http://www.unwater.org/publications/world-water-development-report-2018/>