

ES/SO 352 SUSTAINABILITY: CHALLENGES AND RESPONSES

IES Abroad Barcelona

DESCRIPTION: Sustainability is widely regarded as one of the key challenges facing humanity in the new millennium. Having achieved great success in attaining prosperity for a large proportion of mankind through industrial development, the consequences of unfettered growth have begun to catch up with us. A diverse array of crises has begun to make itself felt, threatening many of the environmental and social support systems we take for granted.

The course “**Sustainability: Challenges and Responses**” is in full alignment with the IES Abroad Global Pillars: Sustainable living, Equitable living and Human wellbeing. A session is dedicated to the IES Abroad Sustainability Plan and all the course topics are rooted in the Sustainable Development Goals. Students can explore and practice different assessment tools like the Ecological Footprint, systems thinking, urban diversity and compacity, or the NEXUS approach (water-energy-food). These tools help them identify and start implementing ways to improve sustainability at different levels.

Global Pillars and class topics:

- **Sustainable living:** Sustainable Development Goals, climate change, ecological footprint, energy, sustainable food systems, the NEXUS approach, waste management.



- **Equitable Living:** Circular economy, sustainable businesses and responsible consumption, social sustainability, diversity and urban sustainability, inequalities between and within countries, local perspectives.



- **Human Wellbeing:** Education for sustainability, policies and programs, human health and nature-based solutions, adaptation to climate change strategies.



The course comprises four sections. In the first section (sessions 1 to 5), we introduce some key concepts that we will use along the whole course. In the second section (sessions 6 to 13), we will examine some of the tremendous challenges that we face, all around the globe: we will identify key problem areas, recognize their consequences, and attempt to understand the reasons for their persistence. In the third section (Sessions 16 to 24), we will discuss various responses born at different levels involving policies, models and frameworks, technologies and social initiatives that may help us change course to a more promising and fulfilling future. This is all meant to guide students in the development of their final project.

“For over 70 years economics has been fixated on GDP, or national output, as its primary measure of progress. That fixation has been used to justify extreme inequalities of income and wealth coupled with unprecedented destruction of the living world. For the twenty-first century a far bigger goal is needed: meeting the human rights of every person within the means of our life-giving planet.”

— Kate Raworth, *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*.

CREDITS: 3 credits

CONTACT HOURS: 45 hours

LANGUAGE OF INSTRUCTION: English



PREREQUISITES: One prior course in one or more of the following disciplines: Political Science, Social Science, History, Environmental Sciences.

ADDITIONAL COST: None

METHOD OF PRESENTATION:

- Lectures: Delivery of core course content.
- Class discussion: Sustainability spans scientific knowledge and personal belief systems. Class discussion enables us to probe the validity and strength of scientific knowledge and argumentation, as well as analyse how our thought processes and behavioural patterns are influenced by, and in turn influence, various sustainability practices.
- Readings: Key texts designed to develop general understanding of the subject matter and foment discussion. The readings listed as “mandatory” for a particular session must be completed BEFORE coming to class that day. The class will be divided in groups and each session two of them will conduct a brief discussion on the corresponding reading. The first group will prepare highlights and questions that the second group will answer.
- Videos: Many sessions include viewing small excerpts from some documentaries or some short videos from key experts related to the readings of each session. This enables us to better approach the facts and especially the applications regarding sustainability.
- Analysis: Basic system diagrams and SWOT analysis are powerful tools for identifying mechanisms of cause and effect, interaction, feedback, and eventual areas of improvement for new actions and projects. By preparing them, students will be able to better understand key aspects of sustainable and unsustainable actions.
- On site classes: On site classes enable experiential learning of innovative technologies and practices relating to sustainability, as manifested in the city of Barcelona.
- Presentations: To assess the assimilation of class contents, students will present in groups.
- Class Project: Over the duration of the course, we will design and implement actions that will improve the sustainability of IES community.

REQUIRED WORK AND FORM OF ASSESSMENT:

- Participation - 10%
- Mid-term collaborative evaluation - 20%
- Assignments and class activities - 30%
- Group presentations - 20%
- Class project - 20%

Class participation

I will need your cooperation to make our time together interesting and beneficial for us all. This shouldn't be too hard, since sustainability is not a dogmatic topic, and it begs for discussion and analysis. I will challenge you to closely examine many assumptions, and to think critically about the concepts, tools and practices we will discuss in class.

Assignments and quizzes

Homework (assigned only for certain sessions) provides an effective means for translating reading assignments into knowledge. They may be transforming text into graphical interpretations of processes called systems diagrams, which link various issues not always viewed as interrelated, and provide a fresh analytical perspective on the topics being studied. Other assignments might comprise class presentation on a current hot topic of your choice, or SWOT Analysis (Strengths, Weaknesses, Opportunities and Threats), as well as pop quizzes with questions of short answers related to the reading or videos seen in class which need to be answered at the beginning of the session and again at the end after the class discussion.

Course related trips (class on site)

Some classes will be held outdoors taking short excursions in Barcelona within the scope of the course, to extend the topics covered in other sessions. These excursions will be within class scheduled time around diverse topics, mainly related to urban sustainability.

Mid-term collaborative evaluation:

A collaborative evaluation will assess students' knowledge of the basic principles of sustainability covered in the first section of the course. Students will work in randomly selected groups of three to develop a brief essay linking class subjects to their majors and professional fields.

Group presentations

To assess the assimilation of class contents, students will select a topic of their choice that relates to class and develop it aiming to improve IES sustainability. Presentations will be made in groups.

Class project

In order to incorporate project-based assessment, a class project will be developed in the second half of the course. After the final presentations, the topic that students vote the most according to its viability to improve IES sustainability will be the general goal of the project undertaken by the whole class. Results will be summarized in different formats (web page, brochure, poster, etc.), submitted to the instructor and presented in class by groups. Students will write down their names next to the document and presentation sections where they contributed, as well as other ways to report the individual contribution of each student to the class project along the term (team organization, retrieval of information, document structure, etc.).

LEARNING OUTCOMES:

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

- recognize the fundamental principles of social, environmental and economic sustainability;
- identify problem areas where unsustainable practices are prevalent and destructive;
- analyse complex problems utilizing the precepts of systems analysis;
- apply a critical sustainability lens to current events; governmental and inter-governmental policy, and other institutions of modern life;
- reflect on their own values regarding a sustainable life-style, and integrate meaningful sustainable practices in their lifestyle.

ATTENDANCE POLICY:

As a member of our class community, you are expected to be present and on time every day. Attending class has an impact on your learning and academic success. For this reason, attendance is required for all IES Barcelona classes, including course-related excursions. 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:

Session	Content	Assignments
Session 1	Basics 1. What IS sustainability, anyway?	
Session 2	Class on site: Barcelona an example of the compact city	
Session 3	Basics 2. Systems Thinking: A Primer	• Capra, F., Luisi, P.L. (2014). The ecological dimension of life. In <i>The Systems View of Life: A Unifying Vision</i> (Ch. 16, p. 341-362).
Session 4	Basics 3. The Sustainable Development Goals: a global assignment	• United Nations (2017). The Sustainable Development Goals Report 2017. (p. 3-14) Available online at: https://unstats.un.org/sdgs/files/report/2017/TheSustainableDevelopmentGoalsReport2017.pdf
Session 5	Basics 4. Sustainability in education. Action Plan for IES Abroad – Barcelona	• Cook, J.W. (2018). Sustainability, Human Well-Being, and the Future of Education; Springer Nature Switzerland AG.: Cham, Switzerland. Available online at: https://link.springer.com/book/10.1007/978-3-319-78580-6#book-header

Session 6	Challenges 1. The Human Factor: Our footprint on the Planet	Dasgupta, P., Dasgupta, A. & Barrett, S. (2021). "Population, Ecological Footprint and the Sustainable Development Goals", <i>Environmental and Resource Economics</i>. Available online at: https://doi.org/10.1007/s10640-021-00595-5
Session 7	Challenges 2. Energy: Sources, Trends and Implications	IEA (2021). <i>World Energy Outlook 2021</i>, International Energy Agency, Paris. Available online at: https://www.iea.org/reports/world-energy-outlook-2021
Session 8	Challenges 3. Agriculture, land use changes and pressure over water: The NEXUS approach	- FAO (2022). <i>The State of the World's Land and Water Resources for Food and Agriculture – Systems at breaking point</i>, Main report, Food and Agriculture Organization, Rome. Available online at: https://doi.org/10.4060/cb9910en - FAO (2021). <i>The State of Food and Agriculture 2021. Making agrifood systems more resilient to shocks and stresses</i>, Rome, FAO. Available online at https://doi.org/10.4060/cb4476en - FAO (2016). Food and Agriculture. Key to achieving the 2030 Agenda for Sustainable Development. Available online at: https://sustainabledevelopment.un.org/content/documents/2313foodandagriculture.pdf
Session 9	Challenges 4. Waste management	"Kaza, Silpa; Yao, Lisa C.; Bhada-Tata, Perinaz; Van Woerden, Frank (2018). <i>What a Waste 2.0 : A Global Snapshot of Solid Waste Management to 2050</i>. Urban Development Series; Washington, DC: World Bank. Available online at: https://openknowledge.worldbank.org/handle/10986/30317 License: CC BY 3.0 IGO.
Session 10	Challenges 5. Climate Change part I	IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: <i>Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change</i> [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3–33, doi:10.1017/9781009325844.001
Session 11	Mid-term Prep walk	
Session 12	MID-TERM COLLABORATIVE EVALUATION	
Session 13	Challenges 5. Climate Change part II	Pörtner, H.-O. <i>et al.</i> (2022), "Technical Summary". [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: <i>Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel</i>

		<i>on Climate Change</i> [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)], Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 37–118, doi:10.1017/9781009325844.002
Session 14	Challenges 6. Water management	United Nations (2023), The United Nations World Water Development Report 2023: Partnerships and Cooperation for Water. UNESCO, Paris. Available online at: https://unesdoc.unesco.org/ark:/48223/pf0000384655
Session 15	Responses 1. The sustainable city	Krueger, E.H., Constantino, S.M., Centeno, M.A. et al. Governing sustainable transformations of urban social-ecological-technological systems. <i>npj Urban Sustain</i> 2, 10 (2022). https://doi.org/10.1038/s42949-022-00053-1
Session 16	Class on site: Urban Planning, Architecture and Transportation	- López, Iván, Jordi Ortega, and Mercedes Pardo (2020), "Mobility Infrastructures in Cities and Climate Change: An Analysis Through the Superblocks in Barcelona", <i>Atmosphere</i> 11, no. 4: 410. Available online at: https://doi.org/10.3390/atmos11040410 - Futcher, J. et al. (2017) 'Creating sustainable cities one building at a time: Towards an integrated urban design framework', <i>Cities</i>, 66, pp. 63–71.
Session 17	Responses 2. The Circular Economy I	Ellen MacArthur Foundation (2012), <i>Towards the Circular Economy Vol. 1: an economic and business rationale for an accelerated transition</i>, p. 13-34. Available online at: https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf
Session 18	Responses 2. The Circular Economy II	Ellen MacArthur Foundation (2012), <i>Towards the Circular Economy Vol. 1: an economic and business rationale for an accelerated transition</i>, p. 13-34. Available online at: https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf
Session 19	Responses 3. Biomimicry and Sustainable Development	Benyus, Janine M (2002). "Echoing Nature. Why Biomimicry now?", <i>Biomimicry. Innovation Inspired by Nature</i>, Harper Perennial, (Ch. 1, pp. 9-17). Available online at: https://www.academia.edu/38300413/Janine_M_Benyus_Biomimicry_Innovation_Inspired_by_Nature_2002_Harper_Perennial_1
Session 20	FINAL PRESENTATIONS	
Session 21	FINAL PRESENTATIONS	
Session 22	Responses 4. Policy, Regulations, Incentives and Voluntary Programs for Sustainability	Cohen, M. J. (2014), "When sustainability bites back: cautionary lessons from the field of public health", <i>Sustainability: Science, Practice, & Policy</i>, Vol. 10, Issue 2, pp. 1–3.
Session 23	Responses 5. Nature Based Solutions	European Environment Agency (2021). <i>Nature-based</i>

		<i>solutions in Europe: Policy, knowledge and practice for climate change adaptation and disaster risk reduction</i> , 159 pp. ISBN 978-92-9480-362-7, DOI: 10.2800/919315
Session 24	Class on site: Urban adaptation to climate change	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
	CLASS PROJECT: FINAL RESULT	

COURSE -RELATED TRIPS:

- Sustainability in Barcelona: walking tour around Ciutat Vella to highlight urban sustainability issues.
- Superilla del Poblenou: from the history of a neglected working class neighborhood to the mixed interventions that we see today.
- Mescladís: example of socially-sustainable company that works for the inclusion of marginalized communities through the restoration sector.
- Consell de cent: green corridor as an example of urban adaptation to climate change

REQUIRED READINGS:

- Benyus, Janine M (2002). "Echoing Nature. Why Biomimicry now?". Biomimicry. Innovation Inspired by Nature, Harper Perennial, (Ch. 1, pp. 9-17). Available online at: https://www.academia.edu/38300413/Janine_M_Benyus_Biomimicry_Innovation_Inspired_by_Nature_2002_Harper_Pereennial_1_
- Capra, F., Luisi, P.L. (2014). The ecological dimension of life. In The Systems View of Life: A Unifying Vision, Ch. 16, p. 341-362.
- Cohen, M. J. (2014), "When sustainability bites back: cautionary lessons from the field of public health", Sustainability: Science, Practice, & Policy, Vol. 10, Issue 2, pp. 1–3.
- Cook, J.W. (2018). Sustainability, Human Well-Being, and the Future of Education; Springer Nature Switzerland AG.: Cham, Switzerland. Available online at: <https://link.springer.com/book/10.1007/978-3-319-78580-6#book-header>
- Dasgupta, P., Dasgupta, A. & Barrett, S. (2021). "Population, Ecological Footprint and the Sustainable Development Goals", Environmental and Resource Economics. Available online at: <https://doi.org/10.1007/s10640-021-00595-5>
- Eizenberg, Efrat; Yosef Jabareen (2017). "Social Sustainability: A New Conceptual Framework". Sustainability, 9 (1): 68. Available online at: <https://doi.org/10.3390/su9010068>
- Ellen MacArthur Foundation (2012), Towards the Circular Economy Vol. 1: an economic and business rationale for an accelerated transition, p. 13-34. Available online at: <https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf>
- Ellen MacArthur Foundation (2017). Cities in the Circular Economy: An initial exploration. Available online at: <https://emf.thirdlight.com/link/6geje0hxi9n1-2aoa77/@/preview/1?o>
- European Environment Agency (2021). Nature-based solutions in Europe: Policy, knowledge and practice for climate change adaptation and disaster risk reduction, 159 pp. ISBN 978-92-9480-362-7, DOI: 10.2800/919315
- FAO (2016). Food and Agriculture. Key to achieving the 2030 Agenda for Sustainable Development. Available online at: <https://sustainabledevelopment.un.org/content/documents/2313foodandagriculture.pdf>
- FAO (2021). The State of Food and Agriculture 2021. Making agrifood systems more resilient to shocks and stresses, Rome, FAO. Available online at <https://doi.org/10.4060/cb4476en>
- FAO (2022). The State of the World's Land and Water Resources for Food and Agriculture – Systems at breaking point, Main report, Food and Agriculture Organization, Rome. Available online at: <https://doi.org/10.4060/cb9910en>
- Fitcher, J. et al. (2017) 'Creating sustainable cities one building at a time: Towards an integrated urban design framework', Cities, 66, pp. 63–71.
- IEA (2021). World Energy Outlook 2021, International Energy Agency, Paris. Available online at: <https://www.iea.org/reports/world-energy-outlook-2021>

- IPCC, (2022). "Summary for Policymakers". In: Pörtner, H.-O. et al. (2022). Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3–33, doi:10.1017/9781009325844.001
- Kaza, Silpa; et al. (2018). "What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050". Urban Development Series; Washington, DC: World Bank. Available online at: <https://openknowledge.worldbank.org/handle/10986/30317>
- Krueger, E.H., Constantino, S.M., Centeno, M.A. et al. (2022). "Governing sustainable transformations of urban social-ecological-technological systems". NPJ Urban Sustainability 2, 10. <https://doi.org/10.1038/s42949-022-00053-1>
- López, Iván, Jordi Ortega, and Mercedes Pardo (2020), "Mobility Infrastructures in Cities and Climate Change: An Analysis Through the Superblocks in Barcelona", Atmosphere 11, no. 4: 410. Available online at: <https://doi.org/10.3390/atmos11040410>
- Pörtner, H.-O. et al. (2022), "Technical Summary". In: Pörtner, H.-O. et al. (2022). Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 37–118, doi:10.1017/9781009325844.002
- United Nations (2017). The Sustainable Development Goals Report 2017, p. 3-14. Available online at: <https://unstats.un.org/sdgs/files/report/2017/TheSustainableDevelopmentGoalsReport2017.pdf>
- United Nations, The United Nations World Water Development Report 2023: Partnerships and Cooperation for Water. UNESCO, Paris
- World health statistics 2021: monitoring health for the SDGs, sustainable development goals. Geneva: World Health Organization; 2021. Licence: CC BY-NC-SA 3.0 IGO. Available online at: https://reliefweb.int/sites/reliefweb.int/files/resources/whs-2021_20may.pdf
- WWAP - United Nations World Water Assessment Programme/UN-Water (2018). The United Nations World Water Development Report 2018: Nature-Based Solutions for Water. Paris, UNESCO. pp. 21-36; 79-87 www.unesco.org/open-access/termsuse-ccbysa-en

RECOMMENDED READINGS:

- Benkler, Y. & Nissenbaum, H. (2006) Commons-based Peer Production and Virtue. The Journal of Political Philosophy: Volume 14, Number 4, p. 394–419. Available online at: http://www.nyu.edu/projects/nissenbaum/papers/jopp_235.pdf
- Brower, M. & Leon, W. (1999). The Consumer's Guide to Effective Environmental Choices: Practical Advice from the Union of Concerned Scientists. Three Rivers Press.
- Capra, F. (2004). The Hidden Connections: A Science for Sustainable Living. Anchor.
- Carson, R. (1964) Silent Spring. Crest
- Cobb, J. & Daly, H. E. (1997) For the Common Good. Beacon Press.
- Diamond, J. (2004). Collapse: How Societies Choose to Fail or Succeed. Viking
- Dr. Seuss (1971). The Lorax. Random House.
- Farmer, J. (2007). *Sustainability study. A case study review of open source sustainability models*. pp. 3, 10-14 (out of 60). Available online at: <http://www.jisc.ac.uk/media/documents/programmes/distributedelearning/sustainabilitystudy-1%5B1%5D.0.pdf>
- Fournier, Valérie. (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
- Frankel, C. (1998). In Earth's Company: Business, Environment, and the Challenge of Sustainability. Conscientious Commerce.
- GreenFacts (2007). *Scientific facts on Climate Change. 2007 Update*. Source document: Intergovernmental Panel on Climate Change (IPCC): "Fourth Assessment Report (AR4)" (2007). Summary & Details: GreenFacts (2007) (Level 1 – 2007 Update, 16 pp). Available online at: <http://www.greenfacts.org/en/climate-change-ar4/climate-change-ar4-foldout.pdf>
- Hawken, P. (1993). The Ecology of Commerce: A Declaration of Sustainability. Collins.
- Kennedy, M. (2008). If money rules the world – who rules money? A case for complementary currencies. Forum CSR international, Vol 28. pp 66-69.
- Leopold, A. (1968) A Sand County Almanac. Oxford University Press.
- Lyon, S. (2014) Fair Trade Towns USA: growing the market within a diverse economy. Journal of Political Ecology Vol. 21. Available online at: http://jpe.library.arizona.edu/volume_21/Lyon.pdf
- McDonough, W.; Braungart, M. (2002). Cradle to Cradle. Remaking the way we make things. North Point Press.

- Pearce, J.M. (2012). The case for open source appropriate technology. *Environ Dev Sustain* (2012) 14:425–431. Available online at: <http://link.springer.com/article/10.1007%2Fs10668-012-9337-9>
- Schumacher, E.F. (1973). *Small Is Beautiful: Economics as if People Mattered*. Harper-Collins.