



CIEE Global Institute - Copenhagen

Course name:	Sustainable Development in the 21 st Century
Course number:	(GI) ENVI 2003 Copenhagen
Programs offering course:	Sustainability and Environmental Sciences Track
Language of instruction:	English
U.S. semester credits:	3
Contact hours:	45
Term:	Spring 2019

Course Description

This course defines and explores sustainability in the 21st century, emphasizing drivers, outcomes and solutions to current unsustainable resource use. Students will investigate, evaluate, communicate and reflect on the multifaceted challenges of sustainable resource extraction related to nature, land transformation, food systems, energy, transportation, contamination, water use, urbanization and climate change. They will research existing solutions, from international treaties to backyard initiatives, debating controversies, assessing scientific, political and cultural components, evaluate the role of current and future technological advances, and identify gaps in what we need to know to construct workable solutions. Using class and online resources, teams of students will develop and present their own solutions to sustainability in the 21st century.

Learning Objectives

By the end of this course students will,

- Explain the United Nations 2030 Agenda for Sustainable Development and articulate its 17 Sustainable Development Goals
- Place current sustainability challenges at their proper scale, from local to global
- Explore challenges to sustainability and how current scientific knowledge and technology address them, as well as what more needs to be developed
- Apply critical thinking to more fully understand proximate and ultimate drivers of unsustainable practices and how to slow or reverse them
- Research case studies of remediation and appreciate that sustainability is not only stopping harmful practices but mending them
- Demonstrate competency in planning and implementing sustainable solutions for the 21st century
- Communicate the importance of sustainability for the 21st century through discussion, debate, writing and oral presentation of data, ideas and concepts
- Appreciate how culture impacts sustainable development and viable solutions to ameliorating harmful practices
- Identify, contact and investigate a group working on sustainable solutions in the local community and critique their operations
- Pose workable and reasonable solutions to a more sustainable 21st century on local, regional and global scales, including how to effect such change



- Evaluate their own responsibility to sustainability and how their personal commitment and decisions can lead to greater sustainability

Course Prerequisites

None

Methods of Instruction

Lectures, discussions, group presentations of case studies and ideas, readings, visits to local sustainability projects and related organizations, case study critique, classroom instruction and assessment will all be used to teach this course. Students will write research and comment on sustainability-related topics in groups and individually. Classroom activities will reviewing key concepts, organizing group projects and critical discussion groups. Students will research and critique current literature, working relevant findings into team sustainability plans. Students will critically evaluate the role of culture in sustainability concepts and solutions. Teams will be required to meet outside of class to research and complete team sustainability plans. Individuals will investigate a sustainability-related project with a local organization.

Assessment and Final Grade

Cultural Critique of Sustainability Essay	10 %
Report on Sustainability Non-profit	10 %
Weekly Quizzes (5)	25 %
Personal Sustainability Audit	15 %
Team Sustainability Plan	20 %
Participation	20 %



Course Requirements

Cultural Critique of Sustainability Essay

Each student will write a 1000 word essay with citations exploring cultural aspects of sustainability. This will include how different cultures define sustainability, see its importance and use science and technology to suggest solution. Finally, students will explore how culture impacts willingness to divert resources to a more sustainable 21st century.

Report on Sustainability Non-Profit

Students will investigate a local sustainability project or organization. They will interview key members and use independent research to assess the organization's sustainability goals, plans, resource needs and outreach. Students will document their experience and perspective as a 5-10 minute film.

Weekly Quizzes

Each week, students will take a quiz on the previous week's course material. Quizzes will have True/False, Multiple Choice, calculations, filling in blanks and short answer questions. Quizzes will cover only new material.

Personal Sustainability Audit

Each student will use principles of sustainability and ecological footprints to examine how their personal decisions can determine their impact. Students will examine their diet, energy use, transportation, consumption patterns and other decisions to construct a personal plan for how they can lead a more sustainable life. This will result in a personal sustainability audit that will lower their ecological footprint by at least 20%.

Team Sustainability Plan

A team of 2-3 students will design and implement a sustainability plan for the 21st century. Students will present relevant findings orally and in writing. The final manuscript should include facts, figures, appropriate statistics, clear presentation of findings and solid recommendations. The final paper will be the equivalent approx. 3000 words of text, with additional citations, figures and tables.

Participation

Participation is valued as meaningful contribution to tangible learning, utilizing resources and materials as part of the course. Meaningful contribution requires students to be prepared in advance of each class session and to have regular attendance. Students must clearly demonstrate they have engaged with the materials as directed, for example, through classroom discussions, online discussion boards, peer-to-peer feedback (after presentations), interaction with guest speakers, and attentiveness on co-curricular and outside-of-classroom activities. Participation is NOT the same as attending.

Class Attendance

Regular class attendance is required throughout the program. Students must notify their instructor via Canvas, beforehand, if possible, if they will miss class for any reason.



Students are responsible for any materials covered in class in their absence. Students who miss class for medical reasons must inform the instructor and the Academic Director (or a designated staff member) and provide appropriate documentation as noted below. A make-up opportunity will be provided to the extent this is feasible.

Due to the intensive nature of the block schedule, all unexcused absences will result in a lower final grade for the course. Each unexcused absence will cause 3 percentage points to be dropped from the final grade. For example, a student with an 88% final grade (B+) and 1 unexcused absence will see it reduced to 85% (B).

Students who transfer from one class to another during the add/drop period will not be considered absent from the first session(s) of their new class, provided they were marked present for the first session(s) of their original class. Otherwise, the absence(s) from the original class carry over to the new class and count against the grade in that class.

CIEE program minimum class attendance standards are as outlined below. Center-specific attendance policies may be more stringent than the policies stated below. The Center / Resident Director sets the specific attendance policy for each location, including how absences impact final grades. Such policies are communicated to students during orientation and via Study Center documents. In the event that the attendance policy for host institution courses differs from CIEE's policy, the more stringent policy will apply.

- Excessively tardy (over 15 minutes late) students will be marked absent.
- Students who miss class for personal travel will be marked as absent and unexcused. No make-up opportunity will be provided.
- Attendance policies also apply to any required co-curricular class excursion or event.
- Persistent absenteeism (students approaching 20% or more of total course hours missed, or violations of the attendance policies in more than one class) may lead to a written warning from the Academic Director or Resident Director, notification to the student's home school, and/or dismissal from the program in addition to a reduction in class grade(s).

Weekly Schedule

Week 1: United Nations 2030 Agenda for Sustainable Development

Session 1.1 UN2030

Students will carefully review the UN 2030 agenda for Sustainable Development and explore how it builds on previous UN Millennium Development Goals. They will see how the new goals seek to achieve what the former goals did not. Students will read and present these goals to one another and explore how education, natural sciences, social and human sciences, cultural understanding, communication and information



are needed to attain them. Students will discuss if there are missing elements or undue weighting of some goals over others. Each student will compile and defend a list of which goals they feel are most important, based on immediate threat, cultural importance, severity or other criteria. There will be an instructor guided review of what has been achieved since 2015 when these goals were presented. A group discussion will explore remaining challenges and specific gaps in the UN development agenda. Finally, the group will explore different stakeholders and their responsibilities to address these challenges.

Reading: Nam, U.V., 2015. Transforming our world: The 2030 agenda for sustainable development.
<https://sustainabledevelopment.un.org/post2015/transformingourworld>
and Chapter 1: What is Sustainable Development?

Week 2 Drivers of Unsustainable Practices, Poverty

Session 2.1 Population and Consumption

Students will track human population growth through time, seeing a steep increase around 1750 at the start of the Industrial Revolution. Students will research what led to the sudden increase in human population in light of models of exponential population growth and technological advances. Students will explore how human population growth coincides with increases in land transformation, contamination, natural resource use and other indicators of global environmental stress. They will connect human population, consumption and technology to assess environmental impact of the human population. They will also assess their own ecological footprint. Students will discuss how a business as usual path will not lead to sustainability. Students will spend time exploring options for non-profit sustainability projects to investigate.

Readings: Chapter 2: Economic Development – How to Measure it, how it Varies around the World, and Chapter 3: A Short History of Economic Development

Quiz 1: The United Nations 2030 Agenda for Sustainable Development

Session 2.2 Local Sustainability Audit



The instructor will walk students through the local community, pointing out places of interest, like schools, conservation and sustainability projects. Students will observe and discuss any local sustainability issues they perceive. They will then build up from the local community to how what they see might impact regional and global sustainability. The audit will further explore local organizations students might investigate.

Readings: Chapter 4: Why did some Countries Advance While Others Remained in Poverty? Ramos-Mejía, M et al. 2017. Sustainability transitions in the developing world: Challenges of socio-technical transformations unfolding in contexts of poverty. *Environmental science & policy* 84: 217-223.

Session 2.3: Poverty: Its Causes and Strategies to End It.

Students will use online resources and the textbook to explore reasons for poverty. They will discuss and debate the relative importance of each driver. Students will compare their consumption and footprint to people in less and more developed countries. The instructor will guide students in an exploration for why some countries advance while others remain in poverty. To do this, they will consider clinical economics, the role of physical geography (transport, energy, disease, suitable land uses), the role of politics, colonization income inequality between countries. Students will then suggest ways a sustainable 21st century can lead to greater equitability both within and between countries.

Readings: Chapter 5: Ending Extreme Poverty, Cruz, M., Foster et al. 2015. Ending Extreme Poverty and Sharing Prosperity. <https://openknowledge.worldbank.org/bitstream/handle/10986/23604/Ending0extreme0rogress0and0policies.pdf?sequence=1>

Assignment Due: Personal Sustainability Audit

Week 3 Planetary Boundaries and Human Rights

Session 3.1 Planetary Boundaries

Students will define planetary boundaries and survey the planetary boundaries identified. To do this, students will study growth dynamics, and consider the cases of energy, food and population. Next, groups of students will tackle one other planetary boundary and dive deep into its causes, consequences and suggested solutions to stay within safe planetary thresholds. Students will then present their findings to one another.



Reading: Chapter 6 Growth within Planetary Boundaries; Steffen, W. et al. 2015. Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223), p.1259855.

Quiz 2: Drivers of unsustainable practices and the origin, maintenance and solutions for poverty.

Session 3.2: Human Rights, Gender Equality and Sustainability.

Here, students will study the economics and ethics of wealth, poverty and inequality. This will include an analysis of who bears the greatest burden from unsustainable practices. Students will review major UN declarations and decisions on this topic, examine the cultural dimensions to social inequality and human rights and how this impacts sustainability. Finally, students will discuss and present possible solutions.

Readings: Chapter 7: Human Rights and Gender Equality, Meinzen-Dick et al. 2014. Gender and sustainability. *Annual Review of Environment and Resources*, 39.

Assignment Due: Cultural Critique of Sustainability Essay

Week 4 Sustainable Food and Sustainable Cities

Session 4.1: Sustainable Food Supply and the End of Hunger.

The instructor will provide statistics and geographic trends related to malnutrition and food scarcity. Students will then study different farming systems and how they are impacted by local abiotic conditions, soils and general ecology. This will lead to exploration of how poor use of natural resources and environmental change lead to food insecurity. They will also see how agricultural practices impact the environment and its sustainability, including soil fertility, future agricultural productivity, water regulation and pest outbreaks. Students will explore ideas for a sustainable global food supply that eliminates hunger while protecting the environment.

Readings: Chapter 10. Sustainable Food Supply and the End of Hunger; Berry, E.M et al. 2015. Food security and sustainability: can one exist without the other?. *Public health nutrition*, 18(13), pp.2293-2302.

Quiz 3: Planetary boundaries and human rights

Session 4.2: Cultural Critique of Sustainability.



Students will select one Sustainability goal from the UN 2030 Goals for Sustainable Development. They will use knowledge from the course as well as online resources to research how culture shapes that goal. They will be responsible for examining relevant drivers to creating the sustainability issue in question and separate how much is global and how much is local. Of this, students will then tease out the cultural elements to these drivers. Students will then examine suggested mechanisms for how the goal in question can be attained and identify any cultural impediments to attaining these goals. Students will write up their findings and hand in a written report at the start of the next session.

Readings: Duxbury, N. and Jeannotte, M.S., 2010, August. Culture, sustainability and communities: Exploring the myths. In *6th International Conference on Cultural Policy Research, Jyväskylä, Finland* (pp. 24-27).

Session 4.3: Urbanization and Sustainability.

Students will first study the geography of human migration throughout history, ending with current urbanization trends. They will pose the question of what makes a city sustainable. They will examine urban infrastructure and its role in a sustainable future. Students will also define urban resilience and examine the capacity of individuals, communities, institutions, businesses and systems within a city to adapt and grow sustainably to stresses.

Reading: Chapter 11: Sustainable Cities

Week 5 Curbing Climate Change and Protecting Biodiversity

Session 5.1 Curbing Climate Change.

Students begin with a primer on the basic science of climate change. Students will investigate consequences of climate change to the natural world, agricultural systems, economy and political stability. They will consider different suggestions for mitigating the impact of climate change on these systems. They will see how current local, regional and global policies interfere or help with mitigation efforts. Students will then articulate and extrapolate current efforts for global cooperation to curb human-caused climate change.

Readings: Chapter 12: Curbing Climate Change, Von Stechow et al. 2015. Integrating global climate change mitigation goals with other sustainability objectives: a synthesis. *Annual Review of Environment and Resources*, 40, pp.363-394.



Quiz 4: Sustainable food and sustainable cities

Session 5.2: Saving Biodiversity.

Students will define biodiversity and its importance to human welfare. Students will list and investigate important ecosystem services. They will share their findings with one another. Students will discuss how human activity compromises biodiversity, leading to losses of abundance, extinctions, introductions of invasive species, and how this erodes natural capital. They will use statistics to articulate the current size of biodiversity loss and its projected scale. Students will explore the culture, legal and economic barriers to biodiversity protection and how to navigate them.

Readings: Chapter 13: Saving Biodiversity, Bennett, E.M et al. 2015. Linking biodiversity, ecosystem services, and human well-being: three challenges for designing research for sustainability. *Current Opinion in Environmental Sustainability*, 14, pp.76-85.

Session 5.3 Student presentations on their sustainability non-profit.

Students will present their 5 – 10 minute films as well as additional perspectives as an oral presentation of no longer than 15 total minutes. Each student will explain the goals of the organization they investigated, their success in attaining those goals, further resources needed to attain goals and any impediments and recommendations for how these goals can be promoted. After presentations, students will assess the importance of local organizations in meeting the relevant UN 2030 Sustainability Goals

Reading: York, P., 2017. Effective Volunteer Engagement for Sustainability and Growth. *The Journal of Nonprofit Education and Leadership*, 7(1).

Report on Sustainability Non-Profit due

Week 6 Sustainable Development Goals and Plans for the Future

Session 6.1 Education.

Using a life-cycle approach to human development, students will examine the role of education in a sustainable 21st century. They will begin with early childhood development and end with the role of higher education in sustainable development. Ultimately, students will suggest important components in education for a sustainable future. Students will critique



past efforts at environmental education, will consider the role of STEM and culture in environmental education and suggest improvements to current practices.

Readings: Chapter 8: Education, Lozano, R et al. 2015. A review of commitment and implementation of sustainable development in higher education: results from a worldwide survey. *Journal of Cleaner Production*, 108, pp.1-18.

Quiz 5: Climate change, biodiversity and education

Session 6.2: The Sustainable Development Goals.

Students will examine the UN 2030 goals as well as those from Rio, Paris and other international accords. They will discuss reasons why some countries sign on and others do not. Students will critique these proposals in light of goal-based development, financing, ecological principles, economics and governance.

Reading: Chapter 14: The Sustainable Development Goals , Barbier, E.B. and Burgess, J.C., 2017. The Sustainable Development Goals and the systems approach to sustainability. *Economics: The Open-Access, Open-Assessment E-Journal*, 11(2017-28), pp.1-23.

Session 6.3 Presentation of Team Sustainability Plans.

Teams of students will present relevant findings and recommendations orally and in writing. The final manuscript should include facts, figures, appropriate statistics, clear presentation of findings and solid recommendations. The final paper will be between 5-7 pages without citations. During this final session, teams will come with their written plans prepared. They will present their sustainability plan orally to the rest of the class. These presentations should not be longer than 20 minutes, including time for questions and discussion. After presentations, students will assess the best roadmap to a sustainable 21st century.

Final Written Team Sustainability Plan due

Course Materials

Course Textbook

Sachs, J.D., 2015. *The age of sustainable development*. Columbia University Press

Readings

- Barbier, E.B. and Burgess, J.C., 2017. The Sustainable Development Goals and the systems approach to sustainability. *Economics: The Open-Access, Open-Assessment E-Journal*, 11(2017-28), pp.1-23.
- Bennett, E.M., Cramer, W., Begossi, A., Cundill, G., Díaz, S., Egoh, B.N., Geijzendorffer, I.R., Krug, C.B., Lavorel, S., Lazos, E. and Lebel, L., 2015. Linking biodiversity, ecosystem services, and human well-being: three challenges for designing research for sustainability. *Current Opinion in Environmental Sustainability*, 14, pp.76-85.
- Berry, E.M., Dernini, S., Burlingame, B., Meybeck, A. and Conforti, P., 2015. Food security and sustainability: can one exist without the other?. *Public health nutrition*, 18(13), pp.2293-2302.
- Duxbury, N. and Jeannotte, M.S., 2010, August. Culture, sustainability and communities: Exploring the myths. In *6th International Conference on Cultural Policy Research, Jyväskylä, Finland* (pp. 24-27).
- Cruz, M., Foster, J.E., Quillin, B. and Schellekens, P., 2015. Ending Extreme Poverty and Sharing Prosperity.
<https://openknowledge.worldbank.org/bitstream/handle/10986/23604/Ending0extreme0progress0and0policies.pdf?sequence=1>
- Lozano, R., Ceulemans, K., Alonso-Almeida, M., Huisingh, D., Lozano, F.J., Waas, T., Lambrechts, W., Lukman, R. and Hugé, J., 2015. A review of commitment and implementation of sustainable development in higher education: results from a worldwide survey. *Journal of Cleaner Production*, 108, pp.1-18.
- Meinzen-Dick, R., Kovarik, C. and Quisumbing, A.R., 2014. Gender and sustainability. *Annual Review of Environment and Resources*, 39.
- Ramos-Mejía, M., Franco-Garcia, M.L. and Jauregui-Becker, J.M., 2017. Sustainability transitions in the developing world: Challenges of socio-technical transformations unfolding in contexts of poverty. *Environmental science & policy*. 84: 217-223
- Steffen, W., Richardson, K., Rockström, J., Cornell, S.E., Fetzer, I., Bennett, E.M., Biggs, R., Carpenter, S.R., De Vries, W., de Wit, C.A. and Folke, C., 2015. Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223), p.1259855
- Von Stechow, C., McCollum, D., Riahi, K., Minx, J.C., Kriegler, E., Van Vuuren, D.P., Jewell, J., Robledo-Abad, C., Hertwich, E., Tavoni, M. and Mirasgedis, S., 2015. Integrating global climate change mitigation goals with other sustainability



objectives: a synthesis. *Annual Review of Environment and Resources*, 40, pp.363-394.

York, P., 2017. Effective Volunteer Engagement for Sustainability and Growth. *The Journal of Nonprofit Education and Leadership*, 7(1). .