Foundations, Principles and Applications of Sustainable Development

IDS2935: Section XX

Fall 2020 | Course Syllabus

Time: TBD
General Education: H, N, WR (2000 Words)
Material and Supplies Fees: None

Teaching Faculty / Instructors:

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Course resources, information, announcements, updates, assignments, and discussions are available through the course canvas site (www.elearning.ufl.edu).

1.0 Course Overview:

The rampant destruction of Amazon forest, acre-by-acre, is the talk of day. It is, simply put, an outcome of the politics of greed, self-interest, and self-indulgence – a culture that destructs nature to its very core. A fundamental question that we need to pose is: who are we in relation to the natural world? In other words, how does human intervention on the environment in various forms lead to the destruction to the natural resources? What we need is a fundamental understanding of sustainable development and how all forms of culture (e.g. consumerism, food, transport, living) transforms nature.

This interdisciplinary Quest 2 course provides an understanding of human interventions on the environment in various forms that has led to the destruction of natural resources. In this course, the key concepts related to sustainable development worldwide, gain familiarity with key environmental and resource issues and the effects on humankind if present population and consumption trends remain unchanged. This course will address core questions about culture and nature with a special focus on human interventions on the environment.

This Class is the Quest 2 (Q2) Curriculum Fills
Social and Behavioral Sciences (S) and International (N) Gen Ed Requirements

What are the Objectives of Quest 2 (Q2)?

Grounded in the modes of inquiry and analysis characteristic of the social and/or biophysical sciences, Quest 2 courses invite students to address pressing questions facing human society and the planet - questions that outstrip the boundaries of any one discipline and that represent the kind of open-ended, complex issues they will face as critical, creative, and thoughtful adults navigating a complex and interconnected world.

What are the Objectives of Gen Ed Social and Behavioral Sciences (S) Classes?

Social and behavioral science courses provide instruction in the history, key themes, principles, terminology, and underlying theory or methodologies used in the social and behavioral sciences. Students will learn to identify, describe and explain social institutions, structures or processes. These courses emphasize the effective application of accepted problem-solving techniques. Students will apply formal and informal qualitative or quantitative analysis to examine the processes and means by which individuals make personal and group decisions, as well as the evaluation of opinions, outcomes or human behavior. Students are expected to assess and analyze ethical perspectives in individual and societal decisions.

What are the Objectives of Gen Ed International (N) Classes?

The N designation is always used in conjunction with another program area. International courses promote the development of students' global and intercultural awareness. Students examine the cultural, economic, geographic,

historical, political, and/or social experiences and processes that characterize the contemporary world, and thereby comprehend the trends, challenges, and opportunities that affect communities around the world. Students analyze and reflect on the ways in which cultural, economic, political, and/or social systems and beliefs mediate their own and other people's understanding of an increasingly connected world.

THESE QUEST AND SUBJECT AREA OBJECTIVES WILL BE ACCOMPLISHED THROUGH:

- Describe how sustainable development is changing humankind's interaction with the planet (ACCE SLO 18)
- Explain the basic concepts of sustainable development
- Discuss the ethical foundation for sustainability and sustainable development
- Identify key environmental and resource issues that threaten quality of life and the environment for present and future generations
- Identify and contrast key international sustainability initiatives
- Explain how various industries and organizations are adopting strategies to function in a sustainable manner
- Indicate how sustainable development concepts can be applied to the creation of a sustainable built environment

AT THE END OF THIS COURSE, STUDENTS WILL BE ASSESSED ON Q2, B, AND N LEARNING OUTCOMES IN FOUR AREAS: CONTENT, CRITICAL THINKING, COMMUNICATION, AND CONNECTION

1) CONTENT SLOs:

Gen Ed B: Identify, describe, and explain the basic concepts, theories and terminology of natural science and the scientific method; the major scientific discoveries and the impacts on society and the environment; and the relevant processes that govern biological systems

Gen Ed N: Identify, describe, and explain the historical, cultural, economic, political, and/or social experiences and processes that characterize the contemporary world.

Quest 2: Identify, describe, and explain the cross-disciplinary dimensions of a pressing societal issue or challenge as represented by the social sciences and/or biophysical sciences incorporated into the course.

This Course:

- AT THE END OF THE COURSE, STUDENTS WILL BE ABLE TO EXPLAIN fundamental concepts of sustainable development affecting multiple aspects of societies world-wide.
- ACHIEVEMENT OF THIS LEARNING OUTCOME WILL BE ASSESSED THROUGH two exams using both multiple choice and essay questions.

2) CRITICAL THINKING SLOs:

Gen Ed B: Formulate empirically-testable hypotheses derived from the study of living things; apply logical reasoning skills effectively through scientific criticism and argument; and apply techniques of discovery and critical thinking effectively to solve scientific problems and to evaluate outcomes

Gen Ed N: Analyze and reflect on the ways in which cultural, economic, political, and/or social systems and beliefs mediate understandings of an increasingly connected contemporary world.

Quest 2: Critically analyze quantitative or qualitative data appropriate for informing an approach, policy, or praxis that addresses some dimension of an important societal issue or challenge.

This Course:

- AT THE END OF THE COURSE, STUDENTS WILL BE ABLE TO ANALYZE AND INTERPRET human intervention on the environment and how sustainable development is changing humankind's interaction with the planet; IDENTIFY key environmental and resource issues that threaten quality of life and the environment for present and future generations.
- ACHIEVEMENT OF THESE LEARNING OUTCOMES WILL BE ASSESSED THROUGH data analysis exercises of society's carbon emissions, energy use, and water use and the term reflection paper (2000 word written report).

3) COMMUNICATION SLOs:

Gen Ed B: Communicate scientific knowledge, thoughts, and reasoning clearly and effectively.

Gen Ed N: The international designation is always in conjunction with another category. Communication outcomes are listed in those subject areas.
Quest 2: Develop and present, in terms accessible to an educated public, clear and effective responses to proposed approaches, policies, or practices that address important societal issues or challenges
This Course:

- AT THE END OF THE COURSE, STUDENTS WILL BE ABLE TO IDENTIFY, CONTRAST, AND PRESENT key international sustainability initiatives and INDICATE how sustainable development concepts can be applied to a sustainable built environment.
- ACHIEVEMENT OF THESE LEARNING OUTCOMES WILL BE ASSESSED THROUGH a group project and an in-class group presentation that includes key scientific findings in written, oral, and visual formats.

4) Connection SLOs:
Gen Ed B: n/a
Gen Ed N: n/a
Quest 2: Connect course content with critical reflection on their intellectual, personal, and professional development at UF and beyond
This Course:

- AT THE END OF THE COURSE, STUDENTS WILL BE ABLE TO ARTICULATE AND CRITIQUE their own personal beliefs and behaviors related to Sustainable Development
- ACHIEVEMENT OF THESE LEARNING OUTCOMES WILL BE ASSESSED THROUGH the term reflection paper.

Writing Requirement
This course confers 2000 words toward the Writing Requirement (WR), which ensures students both maintain their fluency in writing and use writing as a tool to facilitate learning. The writing course grade assigned by the instructor has two components: the writing component and a course grade. To receive writing credit a student must satisfactorily complete all the assigned written work **and earn a minimum grade of C (2.0) for the course**. It is possible to not meet the writing requirement and still earn a minimum grade of C in a class, so students should review their degree audit after receiving their grade to verify receipt of credit for the writing component.

Writing Evaluation

- This course carries 2000 words that count towards the UF Writing Requirement. You must turn in all written work counting towards the 2000 words in order to receive credit for those words.
- The instructor will evaluate and provide feedback on the student's written work with respect to content, organization and coherence, argument and support (when appropriate), style, clarity, grammar, punctuation, and other mechanics, using a published writing rubric (see syllabus page 10).
- More specific rubrics and guidelines for individual assignments may be provided during the course of the semester.

Required Texts:

1. **State of the World 2017**, EarthEd: Rethinking Education on a Changing Planet. The Worldwatch Institute, Washington, DC. ISBN: 9781610918428. *(Referred in Weekly Schedule as SOW2017)*
2. **Sustainability: A Comprehensive Foundation**, Collection Editors: Tom Theis and Jonathan Tomkin, CONNEXIONS, Rice University, Houston, Texas, 2012. *(Referred in Weekly Schedule as SUS)*

All of the media for the course, including videos, readings and audio recordings are available through our Canvas course (see www.elearning.ufl.edu) and some materials will also be available through the UF Libraries Course Reserves.

Recommended Writing Guide and Information about Citations:
APA Formatting and Style Guide:
https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/general_format.html

Citation Management Guide from UF Libraries: http://guides.uflib.ufl.edu/citationsoftware

Grades, Grading Distribution, and Grade Points:

Grades for the course will be calculated through evaluation of the following assignments:

Student grades will be based on exams, quizzes, a term paper and discussion assignments. Optional extra credits are available for this course. There are **no make-ups** for missed quizzes, exams, term paper, and optional extra credit activities.

- **Exams**: Three exams, 50 points each, **150** total points.
- **Quizzes**: 10 quizzes, 20 points each; **200** total points.
- **Term Paper**: **150** total points: Each student is required to submit a 6-page (2,000 word) individual research paper. A template will be provided on e-Learning in Canvas. The paper will be a "state of the country report" on either climate change or water resources. The research paper will (1) outline the country's major climate change or water resource issues, and (2) clearly define and explain the environmental, social, and economic aspects. Feedback will be provided to students on their term paper and an opportunity to resubmit will be provided as well.

Final Grades will be assigned based on the following chart:

A	93-100	4.00		**C**	73-77	2.00
A-	90-93	3.67		**C-**	70-73	1.67
B+	87-90	3.33		**D+**	67-70	1.33
B	83-87	3.00		**D**	63-67	1.00
B-	80-83	2.67		**D-**	60-63	0.67
C+	77-80	2.33		**E**	0-60	0.00

Grade points are assigned based on University of Florida policy:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

General Writing Rubric for Report:

Grading criteria (total 150 points):

1. Structure and formatting (30 points): Spelling and grammar, sentence structure, and general writing; whether the template and format were followed; and appropriate use of citations and formatting.
2. Content (120 points): At least three data points from legitimate sources (30 points); the appropriateness and meaningfulness of the data points for the purposes of this paper (30 points); and discussion of the data and the thoughtful analysis that include, but not limited to, challenges faced by the country; initiatives the country has started; reporting the progress, if available (60 points).

UF student honor code, original work, and plagiarism:

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: 'On my honor, I have neither given nor received unauthorized aid in doing this assignment'." The Honor Code (http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Original thought, writing, and discussion is critical for core questions about our place in the natural world and for meaningful discussions about culture and nature. Please be thoughtful and meticulous in your citations. This video offers useful information for how to avoid plagiarism and cite appropriately: https://mediasite.video.ufl.edu/Mediasite/Play/adaa44500eaf460a84f238e6b9a558f9 If you have any questions, please ask your instructor.

Plagiarism on any assignment will result in a 0 for that assignment. A second incident of plagiarism will result in a failing grade (E) for the course.

Class Attendance and Make-up Work Policy:

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Students Requiring Accommodations:

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation:

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/

Important Student Wellness Resources:

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center:
https://counseling.ufl.edu/, 392-1575; and the University Police Department:392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161. University Police Department, 392-1111 (or 9-1-1 for emergencies). http://www.police.ufl.edu/

Writing Studio:

The writing studio is committed to helping University of Florida students meet their academic and professional goals by becoming better writers. Visit the writing studio online at https://writing.ufl.edu/writing-studio/ or in 2215 Turlington Hall for one-on-one consultations and workshops.

Materials and Supplies Fee:

There are no additional fees for this course.

Weekly Course Schedule:

Week 1	**Introduction to Sustainability**
Summary	In this week, we focus on an important question: *What is wrong the way it is now?* We will look at the climate change and ozone depletion; deforestation and soil erosion; eutrophication and acidification; loss of biodiversity. We learn the history of sustainability; principles and concepts of sustainability; measurements (examples); definition of sustainability with the focus on Brundtland Commission (1987).
Readings	**SOW2017**, Chapter 1: EarthEd: Rethinking Education on a Changing Planet
Media	Watch movie "*Home*"
Assignment	Quiz 1
In-class Discussion	Topics: *Why should we bother about sustainability? Is it fine to construction a fully air-conditioned football (soccer) stadium in Qatar? Is it extravagant? Share your thoughts.*

Week 2	**Environmental Ethics, Food, Culture and Consumerism**
Summary	In this week, we learn concepts such as Introduction to Ethics, Religious Ethics, Environmental Ethics, Economic Ethics; The Three-Legged Stool Precautionary Principle; Irreconcilable Differences; Managing the Global Commons; Resilience & Conflicts; Principle of Transparency & Governance. We will also discuss about food, culture, and consumerism.
Readings	SUS, Chapter 10.1: The Human Dimensions of Sustainability – History, Culture, Ethics (pg. 490-491) **SUS**, Chapter 10.8: Sustainability Ethics (pg. 517-524)
Media	Watch Dr. Jim Sullivan's Lecture, *"Environmental Ethics and Justice"*
Assignment	Quiz 2
In-class Game	Eco-footprint calculator and informal discussion related to human consumption.
In-class Discussion	Topics: *Watch the "Food the World Eats" (Time.com). What is your opinion on food vs. costs vs. nutrition? What do you think about GMO products? Well, how about GMO babies?*
Weeks 3 & 4	**Assessment Frameworks**
Summary	In these two weeks, we will cover various assessment frameworks (such as GPI, HDI, MEA); Millennium Development Goals (MDG); sustainable economy (e.g. ecological economics, ecosystems services, corporate sustainability), and ends with industrial ecology, ecological footprint, eco-efficiency.
Readings	**SUS**, Chapter 4.1: Biosphere – Chapter Introduction, Section 4.1.1 Introduction (pg 117-119) **SUS**, Chapter 9.3.6: Case Study – UN Millennium Development Goals Indicator (pg. 483-484)
Media	Watch Rik Leemans Video "*Lessons from MEA"* Watch TED Talk, Hans Rosling, *"Global Population Growth, box by box"*
Assignment	Quiz 3; Exam 1
In-class Discussion	Topics: *Do you think GDP is the best indicator of a country? GDP vs. GPI vs. HDI – share your thoughts.* *Group project introduction*
Weeks 5 & 6	**Global Warming and Climate Change**
Summary	In these two weeks, we will understand the background on Climate Change issues and then present the overview of the possible climate change mitigation.
Readings	**SUS**, Chapter 3.1: Climate and Global Change (pg 49) **SUS**, Chapter 3.2: Climate Processes, External and Internal Controls (pg 50-62)
Media	Watch video lecture by Dr. Zhong-Ren Peng, "*Preparing for Climate Change"*
Assignment	Quiz 4; carbon footprint group project
In-class Discussion	Topics: *South Florida is facing sea-level rise owing to climate change. Discuss the ramifications of sea-level rise. Impact of sea-level rise in developing vs. developed countries – how does it affect unevenly?*
Week 7	**Energy Resources**
Summary	In this week, we will understand the background on basic energy-related terminology and types of energy resources; explain how energy is produced; provide an overview of energy consumption worldwide and in the specific regions
Readings	**SUS**, Chapter 8.4.1.2: Fossil Fuels (Coal and Gas), (pg. 346-351) **SUS**, Chapter 8.4.1.3: Nuclear Energy (pg. 351-355) **SUS**, Chapter 8.4.2.1: Fossil Fuel (Oil), (pg. 365-366) **SOW2017**, Chapter 8: Social and Emotional Learning for a Challenging Century
Media	Watch TED talk, Bill Gates "*Innovating to Zero"* Watch TED talk, Donald Sadoway, "*The Missing Link to Renewable Energy"* NYTimes Video, "*Life (Mostly) Off the Grid"*

In-class	*Assignment:* energy use group project
Discussion	Topics*: Share your mode of transportation. If you are driving a car, what is the MPG? Why is MPG important? Discuss comfort vs. luxury vs. efficiency.* *Carbon footprint group project presentation*

Week 8	**Renewable Energy Resources**
Summary	This week we will focus on Renewable Energy Systems. More specifically, we will focus on the various types of renewable energy systems (such as solar, wind, geothermal, hydro, etc.) focusing on their significance, implementation in the USA and abroad, barriers to their growth, and the emerging technologies.
Readings	**SUS**, Chapter 8.2.6: Alternatives for Fossil Fuels (pg. 320-321) **SUS**, Chapter 8.4.1.4: Renewable Energy – Solar, Wind, Hydro & Biomass (pg. 355-364)
Media	Watch TED talk, Saul Griffith: "*High-Altitude Wind Energy from Kites!"*
Assignment	Quiz 5
In-class Discussion	Topics: *Share your thoughts on renewable energy systems. How do you select renewable energy systems (PV vs. Solar Thermal vs. Wind vs. Geothermal).*

Week 9	**Water Resources**
Summary	This week, we will focus on water resources, water withdrawal and water consumption. We will also discuss water use in China and the USA and ends with water use in the built environment.
Readings	**SUS**, Chapter 5.2: Water Cycle and Fresh Water Supply (pg. 151-159) **SOW2017**, Chapter 11: Deeper Learning and the Future of Education
Media	Watch NYTimes Video, *"Fiji Water Piracy"* Watch video, *"Living with the Three Gorges Dam"* Watch video, "*Living Machine Technology"*
Assignment	Quiz 6 or project 1; water group project
Discussion	Energy use group project
Group Project 1	In lieu of Quiz 6, students will participate in Group Project #1 (particulars below): **Develop an environmental labeling (rating) system for a product.** You are aware of several rating systems, for example, ENERGY STAR label on flat screen monitors. Similarly, there are several available for rating buildings, e.g., LEED, BREAM, Green Globes, etc. Even monitors and other computer products have labeling systems. Your team's goals are to: (1) identify the product for which you plan to develop an environmental label, (2) develop at least 5 environmental criteria for assessing the product, (3) discuss your work including the criteria and use a sample product and "rate" the product, and (4) design a logo that represents your label.

Week 10	**Material Resources**
Summary	In this week, we will discuss material resources (with the particular focus on green materials), waste, and various environmental labeling programs for product and services around the world.
Readings	**SUS**, Chapter 7.2.4: Environmental Concerns with Wastes (pg. 272-274) **SUS**, Chapter 7.2.5: Waste Management Strategies (pg. 274-278) **SOW2017**, Chapter 13 – Reining in the Commercialization of Childhood
Media	Watch video, "*Allied Waste Construction and Demolition – Recycling Facility"* Watch video, "*Story of Stuff*"
Assignment	Quiz 7; Exam 2
In-class Discussion	Topics: *Discuss the tenets of consumerism vs. shared economy? How do they differ? Discuss some examples of shared economy.* *Discussion of term reflection paper requirements*

Weeks 11 & 12	**Sustainable Built Environment**
Summary	In these two weeks, we will learn the various rating systems used worldwide to assess sustainability of green buildings and then focuses on LEED that originated in the USA. We will also look at the future of sustainable build environment.
Readings	**SUS**, Chapter 8.4.4.4: Built Environment (pg. 386-394) **SOW2017**, Chapter 18: Preparing Vocational Training for the Eco-Technical Transition
Media	Watch TED talk, Sir Norman Foster, "*My Green Agenda for Architecture"* Watch TED talk, William McDonough, "*Cradle to Cradle Design*"
Assignment	Quiz 8
In-class Discussion and Tour	Take a tour of a LEED certified Green Building on-campus. Topics: *What are the characteristics of a green building? Why is it important to practice energy and material efficiency in a world of scare non-renewable energy and material scarcity?*

Week 13	**Low/Net Zero Energy Buildings**
Summary	In this week, we understand the definition of and targets related to zero net energy (NZE) building. We also learn the current state of art and then explain approaches that can help realize NZE buildings. Finally, we will discuss several strategies for achieving NZE buildings such as use of site renewable resources, passive design strategies, and high performance strategies.
Readings	**SUS**, Chapter 8.4.3.1: Geothermal Heating & Cooling (pg. 372-382) **SUS**, Chapter 8.6.4.2: Building Applications (pg. 418-420)
Media	Watch video, "*NIST Net Zero Energy House – Nothing Lost is Everyone's Gain*"
Assignment	Quiz 9 (Group Project #2)
Group Project #2	In lieu of Quiz 9, students will participate in Group Project #2 (particulars below): Study / analyze one building in the UF campus Your team's goals are to: (1) identify the building in UF campus (typically, the one you spend more time inside; well, not your apartment!); is the building LEED certified or equivalent? (2) select at least 5 environmental criteria for assessing the building (these could be related to LEED, GreenGlobes, etc.) (3) discuss, in depth (with pictures and sketches), (a) why the building you selected should (or should not) be a referred to as a "Green Building"? (b) what improvements should the building undergo to become more sustainable? (c) suggest two additional criteria that you would add to the rating system (e.g. LEED) that would help assess the overall sustainability of the built environment.

Week 15	**Sustainable Communities**
Summary	In this week, we will understand what sustainable communities are, how they can be planned and developed. The lecture notes also show how community design can affect our health. You can read about Seattle as an example of sustainable community.
Readings	**SUS**, Chapter 8.3: Case Study: GHG and Climate Change (pg. 332-337) **SOW2017**, Chapter 22: Educating Engineers for the Anthropocene
Media	Watch video, Joseli Macedo "*Sustainable Communities – Curitiba, Brazil"* Watch TED talk, Jaime Lerner, "*A Song of the City – Curitiba, Brazil"*
Assignment	Quiz 10; Exam 3; Term reflection paper due
In-class Discussion	Topics: *Share examples of sustainable communities? Is carbon neutral communities a reality?* *Final group project presentations*