

FLORIDA INTERNATIONAL UNIVERSITY
Department of Civil and Environmental Engineering
EGN 4070: Engineering for Global Sustainability and Environmental Protection

Course Syllabus

Spring 2016

Instructor: Anna R. Bernardo-Bricker, Ph.D.
Meeting Place and Time: **Section U01 and RXA1:**
 Mo, We 9:30 AM - 10:45 AM
Room EC 1113

Blackboard Assisted: <https://fiu.blackboard.com>
Instructor's e-mail: abernard@fiu.edu
Instructor's Office Location and Hours: EC 3746
 Tues 10:00 to 11:00AM, Fri 1:00 to 2:00 PM
 Other times by appointment

Course Description: From *FIU-Civil and Environmental Engineering-Undergraduate 2015-2016 Catalog*:
 “This course examines the effects of modern humans on the environment and explores the role of engineers in creating an environmentally sustainable future. Also serves as a global learning course. Prerequisites: ENV 3001 or PHY 2049 and CHM 1046”

Course Objective: This course is intended to provide insight into engineering design for a sustainable future that protects the natural environment.

Textbook and other Reading Material: **Required Textbook + Digital Access (purchased by student):**
 “Engineering Applications in Sustainable Design and Development”, SI Edition, 1st Edition, by Bradley Striebig, Adebayo A. Ogundipe, and Maria Papadakis. The ISBN for the bundle is 9781337056540. The bundle includes a paper-back copy of selected chapters of the textbook, plus the MindTap access via Blackboard.

Required Reading Material (provided by Instructor):

This is a reading and writing **intensive** course. Students will be given access to relevant and current literature from a variety of sources, but mainly including congress proceedings and peer-reviewed articles from the Library of the American Society of Civil Engineers (ASCE).

Evaluation Criteria and Grading: **Classwork:**
 This course strongly depends on **active, engaged participation in class activities and discussions.** Classwork will be assessed through brief writing or presentations exercises, carried out by students either individually or in group. There is **absolutely no makeup** for any of the graded classwork activities.

Individual Cengage MindTap™ Quizzes:

Quizzes will be available online via Blackboard. The purpose is to assess how well students are keeping up with the pace of instruction based on knowledge gained from the textbook. A total of 12 quizzes will be administered; quizzes corresponding to chapter 1 through chapter 6 are valued at 20 points each while quizzes corresponding to chapter 7 through chapter 12 are valued 40 points each. For the calculation of the student's final grade, the lowest grade will be dropped.

Individual Writing Assignments:

These assignments may include calculations; however, they mostly consist of reflective essays. These essays constitute a direct method to assess student's achieving of the Global learning Outcomes (see page 5). Specific questions will be given in order to guide student's thoughts in bringing together the theory (textbook) and ideas learned throughout the course. Assessment will be based on evidence of the depth of understanding and the ability to make connections between interrelated subjects and ideas. Please note each assignment's weight in the corresponding text as not all assignments carry equal weight. **All submitted assignments must:**

- be typed using Microsoft Words: Times New Roman (or equivalent) 12-point font, spacing set at 1.5 lines, margins set at 1" each top, bottom, left and right sides of page.
- have a complete header containing student's full name, class number code and name, Professor's full name, assignment date, and assignment name.
- include citations and list of references in the appropriate format, as needed.
- be submitted via Turnitin™ within our course's Blackboard.

Capstone Group Assignment:

Divided into groups of 3-4 people, students will analyze/study one topic or case scenario. Details will be provided in late February.

Service Activity:

Students will participate in a service activity led by our University Office of Sustainability (FIU-GoGreen). This Spring 2016, the activity supports a current "Wetland Restoration Ecology" project being conducted at FIU-Nature Preserve. The complete activity consists of two parts: The class will attend a "field-trip" to the restoration site on January 20, 2016 during regular class time; subsequently students will complete a written assignment.

Exam:

There will be one final comprehensive exam assessing the overall level of knowledge and comprehension of the concepts and terminology gained throughout the course. This exam consists of a combination of short concept or reflective questions, graphic interpretation, and short fundamental quantitative exercises.

Grade Calculation:

MindTap Quizzes:	15%
Reflective Essays :	35%
Classwork:	10-15%
Capstone Group Assignment (Written + Presentation):	20%
Exam:	20%

Letter Grade will be assigned based on the following scale:

94.0	<	A	≤	100.0	70.0	<	C	≤	74.0
90.0	<	A-	≤	94.0	66.5	<	C-	≤	70.0
86.0	<	B+	≤	90.0	63.0	<	D+	≤	66.5
82.0	<	B	≤	86.0	59.5	<	D	≤	63.0
78.0	<	B-	≤	82.0	56.0	<	D-	≤	59.5
74.0	<	C+	≤	78.0			F	≤	56.0

**General
Classroom
Behavior
Guidelines:**

Purposeful class attendance has been found to have a strong positive correlation to higher student performance. Purposeful attendance is based on the following four criteria: arriving to class on time (sign-in), bringing the textbook to each class, displaying an attentive demeanor during class (watching and listening to screenings of short films, listening when instructor and peers are speaking), and eliminating electronic distraction.

Electronic devices such as cellular telephones, including accessories, should be turned off at all times. Other electronic devices such as tape recorders, cameras, audio/video recording devices, or similar devices are not permitted in the classroom.

Recording of lectures using any recording devices is not permitted unless you have written permission from the Disability Resource Center (DRC).

Failure to abide by these guidelines will result in a lower classwork grade, and may result in further disciplinary actions.

**Academic
Misconduct:**

Students are expected to uphold the standards of academic integrity and the policies of the University regarding conduct. Cheating and plagiarism will not be tolerated; these offenses can result in failing the course, suspension, or expulsion from the University.

FIU Academic Misconduct Statement

“Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are

deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.”

**Learning
Outcomes:**

By the end of this course, students should be able to:

- Appreciate the impact of modern humans on the earth’s carrying capacity.
- Discuss some of the current environmental and social sustainability challenges.
- Describe the major components/principles of sustainable development.
- Articulate the role of the civil and environmental engineer in identifying the resources, technologies and integrative design strategies that support sustainable developments.
- Recognize the methods, tools, and incentives used to “quantify” or evaluate the various factors that relate to the sustainability of a project.
- Assess, judge, evaluate, interpret, justify, and/or determine design solutions that include consideration of sustainable development.

**ABET
Outcomes:**

This course is designed to enable students to meet the following ABET-related outcomes.

Technical proficiency:

Upon successful completion of this course, **students will have an ability to:**

- (a) apply knowledge of mathematics, science, and engineering
- (e) identify, formulate, and solve engineering problems
- (k) use the techniques, skills, and modern engineering tools necessary for engineering practice

Communication:

Upon successful completion of this course, **students will have an ability to:**

- (d) function on multidisciplinary teams
- (g) communicate effectively

Responsible Citizenship:

Upon successful completion of this course, **students will demonstrate:**

- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (j) a knowledge of contemporary issues

Ethical Behavior:

Upon successful completion of this course, **students will demonstrate:**

- (f) an understanding of professional and ethical responsibility

Global Learning Outcomes:

This course is also intended to serve as an upper division elective addressing FIU's global learning outcomes. The following global learning outcomes will be addressed:

Global Awareness: Students will demonstrate an understanding of the interrelatedness of environmental problems around the world; that these problems have no national borders; and that the extent of these problems is affected by burgeoning human population and consumption, as well as by different socioeconomic, technological, and other conditions. **This outcome will mainly be assessed by means of two individual written reflective essays, and the final exam.**

Global Perspective: Students will be able to conduct an analysis of the global nature of a selected environmental problem and the extent to which factors such as economics, technology, and society contribute to the problem. **This outcome will mainly be assessed by means of one individual written reflective essay, and the capstone group assignment.**

Global Engagement: Students will demonstrate a willingness to develop an engineering approach, solution, or technology that avoids or reduces adverse environmental impact, is more sustainable, and is appropriate within the framework of economic, technological, and societal factors at national, regional, and global levels. **This outcome will mainly be assessed by means of the service activity and follow up written essay, and the capstone group assignment.**

Notes corresponding to CLASS SCHEDULE presented in page 6:

- (a) Meeting at Nature Preserve (North Entrance) at Maidique Campus
- (b) Collaborative Online International Learning (COIL) Courses. Prof. Bricker will be attending a training organized by FIU-Office of Global Learning
- (c) OSAS: Office of Student Access and Success –Stephanie Strange, Associate Director. Engineering. Solar-powered house now located in our Engineering Center parking lot (facing Flagler Street), was chosen by the U.S. Department of Energy to compete in its 2011 Solar Decathlon.
- (d) Last day to drop a course with a DR grade (check panthersoft for deadline time)
- (e) Meeting at MANGO building at Maidique Campus. Specific location will be announced in class

*The instructor reserve the right to alter the content of "CLASS SCHEDULE" including Topics' schedule, and the number, type and weigh of assessments solely at her discretion, **in the event of reasonable circumstances** including, but not limited to: adjusting the pace to accommodate class progress or current event opportunities as well as adverse situations such as acts of nature, changes in University schedules, excessive delay in the delivery of textbooks to students, and other. Students are responsible for keeping up with all adjustments to the course calendar posted on Blackboard or via direct communication with Instructor (in-person, by phone, by e-mail).*

CLASS SCHEDULE

Date	Home Assignments DUE dates	Topic Start Date or Scheduled Activity Date
Mo Jan 11		
We Jan 13		
Mo Jan 18	Martin Luther King Holiday (University Closed)	
We Jan 20	ESSAY 1	(a) Meet at Nature Preserve to kick off Global Engagement activity
Mo Jan 25	MindTap 1 to 6	Textbook Chapter 7: Models for Sustainable Engineering
We Jan 27	Prof. Bricker attending COIL^(b) training course: No class	
Mo Feb 1		
We Feb 3		
Mo Feb 8	MindTap 7	Textbook Chapter 8: Energy Conservation and Development
We Feb 10	ESSAY 2	
Mo Feb 15		
We Feb 17		(c) Presentation by Ms. Strange (OSAS) and visit to FIU Solar House
Mo Feb 22	MindTap 8	Textbook Chapter 9: Industrial Ecology
We Feb 24		
Mo Feb 29		
We Mar 2		
Mo Mar 7		
We Mar 9	MindTap 9	Textbook Chapter 10: Life Cycle Analysis
Mo Mar 14	March 14 – 19, Monday – Saturday Spring Break (University Open, No Classes)	
We Mar 16		
Mo Mar 21 ^(d)		
We Mar 23	MindTap 10	
Mo Mar 28	ESSAY 3	Textbook Chapter 11: Sustainability and the Built Environment
We Mar 30		
Mo Apr 4		
We Apr 6		
Mo Apr 11	MindTap 11	Textbook Chapter 12: Challenges and Opportunities for Sustainability in Practice
We Apr 13	ESSAY 4	
Mo Apr 18		Capstone Group Assignment DUE
We Apr 20		(e) Tour of LEED certified building
Mo Apr 25	MindTap 12	
We Apr 27		
Week May 2-7		Final Exam at date/location to be assigned in PantherSoft