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

Course Syllabus  Spring 2018

Instructor: Anna R. Bernardo-Bricker, Ph.D.

Meeting Place and Time: Section U01
Monday and Wednesday  9:30 AM - 10:45 AM
Room EC 1110

Blackboard Assisted: https://fiu.blackboard.com
Instructor’s e-mail: abernard@fiu.edu
Instructor’s Office Location and Hours: Other times by appointment

Course Description: From FIU-Civil and Environmental Engineering-Undergraduate 2017-2018 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: The course is intended to provide insight into engineering design for a sustainable future that protects the global natural environment. The expected learning outcomes are listed in page 3.

This is a Discipline-Specific Global Learning (GL) course that counts toward your GL graduation requirement. Therefore, it is designed to enable students acquiring specific Global Learning Outcomes in accordance to the FIU-GL initiative. Both the specific course’s learning outcome and the required GL outcomes are indicated in pages 3-4.

Textbook and other Reading Material: Purchased by student: Textbook (Required) + Digital Access (Desirable)

Required Reading Material (provided by Instructor):
This is a reading and writing intensive course. As a Global Learning course, in addition to textbook-based information, reading and other course materials produced by international authors and published in a variety of peer-reviewed journals and other sources/media must be incorporated as part of the learning process. Students will be given access to relevant and current literature from a variety of sources, but mainly including congress proceedings and peer-reviewed articles.
Learning Assessment Criteria:

**Classwork Assignments**
Success in this course strongly depends on **active, engaged participation in class activities and discussions which will take place at every class meeting.** Classwork may include a variety of activities based on assigned readings or video documentaries. Learning will be assessed via quizzes, brief writing or informal presentations. These may be carried out by students either individually or in group. There is **absolutely no makeup** for any of the graded classwork activities.

**Individual Home Assignments**
These assignments are important to assess on an individual basis fulfilment of the Global Learning Outcomes (see pages 3-4) based on evidence of the depth of understanding and the ability to make connections between interconnected subjects and ideas presented in class. Rubrics will be used for evaluation. Two of the writing assignments, which may be incorporated into a home assignment or aside from it, consist of reflective essays each based on the following two activities:

- **Individual Engagement Activity:** Students will select to participate in one (1) engagement activity from a specified selection list. This participation is an opportunity to explore a variety of sustainable engineering concepts and practices. The list and description of the possible activities is available on our course’s Blackboard. Students must provide evidence of attendance or participation as appropriate in each case. Learning will be assessed via a reflective essay.

- **Class Field Trip:** Our class will participate in a field trip to a LEED certified building(s) (Leadership in Energy & Environmental Design, green building certification program) at the FIU-Main campus. Learning will be assessed via a reflective essay about the field trip experience.

**Culminating Group Assignment**
Groups of 3-5 students will analyze/study one topic or case scenario of application of sustainability principles and models and will prepare a paper and presentation. Details will be provided in early March.

All writing assignments must:
- be typed using Microsoft Words: Times New Roman (or equivalent) 12-point font, spaced 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 the course’s Blackboard.

**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 concept or reflective questions, graphic interpretation, and short fundamental quantitative exercises.
Final Course Grade Calculation:

Final Grade will be calculated based on the following weight-percent of the assessment points in each category:

- Classwork Assignments: 30%
- Individual Home Assignments: 25%
- Culminating Group Assignment: 20%
- Final Exam: 25%

Letter Grade for this course will be assigned based on the following scale:

- 96.0 < A < 100
- 92.0 < A- ≤ 95.0
- 88.0 < B+ ≤ 91.0
- 84.0 < B ≤ 87.0
- 80.0 < B- ≤ 83.0
- 76.0 < C+ ≤ 79.0
- 72.0 < C ≤ 74.0
- 68.0 < D ≤ 71.0
- 64.0 < F ≤ 59.0

Borderline grades will be decided based on excellence in the qualities of individual and capstone assignments, or performance in the final exam.

Learning Outcomes:

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

- Articulate the role of engineers, with emphasis on civil and environmental disciplines, in identifying the resources, technologies and design strategies that support sustainable developments.
- Define concepts and principles, metrics and indicators of sustainable design.
- Identify the major current energy challenges facing the global community and explore several major strategies for greater energy sustainability; including efficiency, conservation, energy recovery, renewable energy and alternative fuels, fuel switching, appropriate technology, and distributed energy.
- Recognize the basic principles of industrial ecology.
- Describe the concept “life cycle” and review life cycle assessment methodologies.
- Know the concepts and principles associated to green building, and sustainable land-use planning and discuss how these are linked to green building rating systems.
- Review the role of governmental policymaking in overcoming those obstacles.
- Identify the dynamics in the adoption of new technologies and the specific challenges involved in achieving those that represent a greater environmental sustainability goal, and the role of governmental policymaking in overcoming those challenges.

Global Learning Outcomes:

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 be assessed by means of classwork, one home assignment, and the final exam.
**Global Perspective**

Students will demonstrate the ability to conduct multi-perspective analysis of local, global, international, and intercultural problems as they pertain to the practice of engineering with a sustainable focus. **This outcome will be assessed by means of classwork, and one home 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 be assessed by means of reflections on engagement activities (one individual and one class field trip), and one culminating group assignment.**

**ABET Outcomes:**

This course is designed to support instruction and provide assessments aligned with specific ABET Student Outcomes. Thus, students who successfully complete the course should be able to demonstrate:

1. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
2. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
3. an ability to acquire and adapt new knowledge as needed, using appropriate learning strategies.

The outcome identifiers, herein used, correspond to the naming system that is currently used in the ABET Criteria for Accrediting Engineering Programs (www.abet.org).

**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, bringing the textbook and other supporting materials to each class, displaying an attentive demeanor during class (watching and listening to screenings of short films, listening when instructor and peers are speaking, etc.), and eliminating electronic distraction.

The use of electronic devices such as cellular telephones, any type of audio and/or video recording devices, laptops, and any other similar or associated devices is not permitted. These devices must be turned off and away from view during class time. Video and Audio recording of lectures and guests’ speakers presentations using any recording devices is not permitted. Students who need special accommodations must request these via the Disability Resource Center (DRC).

Failure to abide by these guidelines constitutes “Disruption” which is considered as a form of Academic Misconduct (Policies-Honors College). Therefore, these behaviors 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.”

Misconduct includes: Cheating – The unauthorized use of books, notes, aids, electronic sources; or assistance from another person with respect to examinations, course assignments, field service reports, class recitations; or the unauthorized possession of examination papers or course materials, whether originally authorized or not. Plagiarism – The use and appropriation of another’s work without any indication of the source and the representation of such work as the student’s own. Any student who fails to give credit for ideas, expressions or materials taken from another source, including internet sources, are responsible for plagiarism.” Disruption. – Deliberate, repeated disruption of a class, lecture, workshop, or other academic activity, vocally, physically, or by inappropriate use of electronic devices, and/or inappropriate remarks or behavior by a faculty member.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Scheduled Activity or Home Assignment Due Date</th>
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<tbody>
<tr>
<td>Mo Jan 8</td>
<td>Introduction to the Course</td>
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<td>We Jan 10</td>
<td>The concept of Systems</td>
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<td>Mo Jan 15</td>
<td><strong>Martin Luther King Holiday (University Closed)</strong></td>
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<td>We Jan 17</td>
<td>Earth’s interrelated systems</td>
<td>Quiz + Collaborative writing based on NOVA-Earth from Space</td>
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<td>Mo Jan 22</td>
<td>Cultural Intelligence as a measure of Cultural Awareness and Global Competency</td>
<td>Student’s Presentations based on assigned literature</td>
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<td>We Jan 24</td>
<td>Metrics and Indicators of Sustainability (based on excerpts from Textbook Chapters 3, 4, 5, and 7)</td>
<td>Instructor’s Presentation</td>
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<td>Mo Jan 29</td>
<td>Models for Sustainable Engineering (based on Textbook Chapter 7)</td>
<td>Home Assignment #1 DUE</td>
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<tr>
<td>We Jan 31</td>
<td>The concept of stakeholders</td>
<td>Class discussion based on assigned materials (stakeholders in the water management system)</td>
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<td>Mo Feb 5</td>
<td>Textbook Chapter 8: Energy Conservation and Development</td>
<td>Instructor’s Presentation</td>
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<tr>
<td>We Feb 7</td>
<td>Textbook Chapter 8: Energy Conservation and Development</td>
<td>Instructor’s Presentation</td>
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<td>Mo Feb 12</td>
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<td>Instructor’s Presentation</td>
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<td>We Feb 14</td>
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<td>Instructor's Presentation</td>
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<td>Mo Feb 19</td>
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<td>Instructor’s Presentation</td>
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<tr>
<td>We Feb 21</td>
<td>Textbook Chapter 9: Industrial Ecology</td>
<td>Instructor’s Presentation</td>
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<td>Mo Feb 26</td>
<td>Textbook Chapter 10: Life Cycle Analysis</td>
<td>Instructor’s Presentation</td>
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<tr>
<td>We Feb 28</td>
<td><strong>Field Trip to LEED Certified building(s) at FIU-Maidique</strong></td>
<td>Instructor’s Presentation</td>
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<td>Mo Mar 5</td>
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<td>Home Assignment #2 DUE</td>
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<td>We Mar 7</td>
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<td>Home Assignment #3 DUE</td>
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<td>Mo Mar 12 &amp;</td>
<td>March 12 – March 17, Monday – Saturday</td>
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<td>We Mar 14</td>
<td>Spring Break, University Open, No Classes</td>
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<tr>
<td>We Mar 19</td>
<td>Textbook Chapter 10: Life Cycle Analysis</td>
<td>Instructor’s Presentation</td>
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<td>We Mar 21</td>
<td></td>
<td>Quiz + Collaborative assignment based on Textbook Chapter 10</td>
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<tr>
<td>Mo Mar 26</td>
<td></td>
<td>Collaborative assignment based on Textbook Chapter 10 (continued)</td>
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<tr>
<td>We Mar 28</td>
<td>Textbook Chapter 11: Sustainability and the Built Environment</td>
<td>Instructor’s Presentation</td>
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<td>Mo Apr 2</td>
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<td>Instructor’s Presentation</td>
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<td>We Apr 4</td>
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<td>Quiz + Collaborative assignment based on Textbook Chapter 11</td>
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<tr>
<td>Mo Apr 9</td>
<td>Textbook Chapter 12: Challenges and Opportunities for Sustainability in Practice</td>
<td>Instructor’s Presentation</td>
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(*) Last day to drop a course with a DR grade (check panthersoft for deadline time)

NOTES:

1) The instructor reserves the right to alter the content of the “CLASS SCHEDULE” including Topics, and the number, and type of assessments solely at her discretion, in the event of reasonable circumstances including, but not limited to:
   • Adjusting the pace to accommodate class progress
   • Changes in the date of the field-trip
   • Current event opportunities
   • 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).

2) Instructor’s presentations are interactive and assignment may be given. There is absolutely no makeup for any of the graded classwork activities.