Introduction to Sustainability - ISC 1500  
Syllabus - Fall 2013  
Florida Institute of Technology

Course Description
This 3-credit course is available as an elective to undergraduates wishing to learn the theory and practice of sustainability within their specific areas of interest. Emphasis is also on applications across differing disciplines. This is the gateway course for the Undergraduate Major and Minor Program in Sustainability. There are no prerequisites. Undergraduates from any college are eligible for this course whether majoring/minoring in Sustainability or not.

We examine the scientific and policy efforts to optimize the management of environmental, economic, and social resources. One of the most common sustainability definitions is from the The Brundtland Commission (1987): "... meeting the needs of the present generation without compromising the ability of future generations to meet their own needs." This cuts across almost all human endeavors and is applicable to programs in all of the Florida Tech Colleges.

Through lectures, readings, class discussions and a project, the course will examine issues essential to learning best practices in sustainability. Prominent issues include:
- systems thinking tools and the decomposition of complexity;
- human population trends and associated resource demands;
- energy use trends, including status quo and alternative production approaches;
- regional and global climate trends and implications, including policy alternatives;
- economic and social drivers, including triple bottom line business practices
- food and water security, including production and management alternatives;
- ocean and land ecosystems: trends and management alternatives;
- market and other incentives; best practices for building design; community planning.
- behavioral economics: constraints and opportunities for sustainability advances

Indicators to measure sustainability within differing disciplines will be examined and utilized. The roles of private, public, nonprofit, and other sectors will be comparatively examined across linked topics. Paths to solutions will be emphasized - focusing on student interests.

When, Where, Instructor
Days and Time: Tue and Thur, 12:30-1:45
Room: Skurla Hall, Rm. 102; ANGEL will be the course web portal for registered students.
Dr. K. Lindeman, Professor, Dept. of Education and Interdisciplinary Studies
Office: Shepard Bldg. Room 103
Office Hours: Tue: 2:00-4:00; Wed: 1000-4:00; Thu: 2:00-5:00. I often schedule other times by appointment: lindeman@fit.edu

Reading Materials and Course Schedule
There are many books on many diverse sustainability issues; very few are organized as introductory textbooks. Due to the multi-disciplinary nature of the course and the diverse student population (from all colleges on campus and many global continents), we will use two books for portions of the semester. All students will need both of these books (they are inexpensive):
Course readings will also include technical journal articles, government and NGO reports, and significant current articles from print and web media. These readings and assigned chapters from the books will be posted on ANGEL. Once familiar with the diverse primary issues, the semester can include additional readings from these and other books:

**Working Course Schedule**  Can be subject to change according to breaking issues/opportunities.

Wk 1
- Introduction to the Class; Sustainability Basics; Our Social Capital
- Sustainability Concepts and Terms; Governance and Scales of Decision-Making

Wk 2
- Systems and Tools for Decomposing Complexity; Challenges and Opportunities
- Population Growth; Human Populations: Past and Future Trends

Wk 3
- Consumption Patterns; Ecological Footprints
- Food and Water Security: Status and Trends

Wk 4
- Climate and Energy: Past and Present; Status Quo, Alternatives, and Timing
- Energy and Climate: The Future; Roles of Technology and Markets

Wk 5
- Economics: Growth Trends; Ecosystem Services and Total Valuation
- Resources, Wealth Distribution and Quality of Life; Environmental Security

Wk 6
- The Five Guerillas and Springing System Traps; Discuss Term Papers
- Messaging: The Unavoidable Importance of Framing and Marketing Complex Ideas

Wk 7
- Review for Midterm
- Midterm Exam

Wk 8
- Fall Break – No Class on Tue.
- Review Midterm Exam Results; Term Paper Discussions

Wk 9
- Measuring Sustainability: Indicators and Certifications
- Demand-Side Tools incl. Paper Certifications; Supply-Side Tools incl. Protected Areas

Wk 10
- Demand-Side and Supply-Side Tools
- Institutional and University Sustainability

Wk 11
- Messaging: Going Deeper – Climate Science Examples
- Marketing Complex Ideas
Wk 12
- Systems Interconnectivity among Primary Sustainability Challenges
- Springing Systems Traps: The Paradox of Growth

Wk 13
- Systems Interconnectivity: Economics-Climate-Governance
- Sustainability Solutions: Global Examples

Wk 14
- Topics Determined by Student Interest
- Sustainability Solutions: U.S. Examples

Wk 15
- Climate Adaptation; Coastal and Ocean Systems;
- Governance and Technological Innovations

Wk 16
- Review for Final
- No Class - Final Prep.

Wk 17 Finals Week
- Final Exam

Student Learning Outcomes
- Increased knowledge of the conceptual history and logic of sustainability practices.
- Increased understanding of real-world applications of current sustainability principles.
- Increased understanding of systems thinking tools and the decomposition of complexity.
- Ability to debate common sustainability issues from multiple perspectives.
- Experience with the measurement of sustainability: utilizing indicators and other tools.
- Recognition of uncertainty envelopes and constraints on predictive knowledge.
- Ability to apply best practices in sustainability to one’s specific field of interest.
- Ability to apply interdisciplinary approaches to sustainability outside of one’s field.
- Experience with the challenges and opportunities of applying science to governance.
- Messaging skills needed to deliver scientific information to popular audiences.
- Experience in abstract theoretical evaluation of sustainability challenges and solutions.
- Improved critical reading and writing skills within both scientific and policy documents.

Grading:
35% Homework and Quizzes
25% Midterm
15% Project
25% Final exam

Students can sharpen your writing skills with this tutorial:
http://www.bristol.ac.uk/arts/exercises/grammar/grammar_tutorial/index.htm

Classroom Protocol
- Students enter class prepared to critically assess the latest assigned reading.
- Class participation is important. All students should measurably contribute to classroom discussions.
- On-time attendance at each class meeting is expected.
- Repetitive tardies or absences can affect a student grade. Please consult with the instructor proactively regarding partial or complete class absences.