Syllabus: Introduction to Sustainability, SUS 1500
Florida Institute of Technology - Aug. 2020

Course Description

This 3-credit course is for undergraduates seeking to learn the theory and practice of sustainability with a focus on their specific areas of interest. Emphasis is on applications across differing disciplines. This is the gateway course for the undergraduate major and minor program in SUS. There are no prerequisites. This course is a prerequisite for SUS 3250, Systems, Governance and Sustainability, and the capstone project courses (SUS 3999 and SUS 4000).

We examine 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. Paths to applied solutions are emphasized - focusing on student interests.

Through lectures, readings, and class discussions, the course examines issues essential to learning best practices in sustainability. Prominent issues include:
- decomposing complexity using systems thinking tools;
- human population trends and associated resource demands;
- regional and global climate trends and implications, including policy alternatives;
- types of energy and usage trends, including status quo and renewable production;
- ocean and land ecosystems: trends and management alternatives;
- economic and social drivers, including triple bottom line business practices;
- market-based incentives; best practices for building design; community planning
- communication and behavior: challenges and opportunities for sustainability advances.

Student Learning Outcomes are provided near the end of this document.

When, Where, Who

Days and Time: **Tue and Thur, 12:30-1:45**
Location: Crawford Bldg., Rm 402 and by Zoom**.** Canvas will be the web portal.
Dr. K. Lindeman, Professor, Program in Sustainability, OEMS
Office: Shepard Bldg. Room 103. Meetings at the building will be socially distanced with masks.
Office Hours: Tue. 2:00-4:00; Wed. 11:00-1:30; Thu. 2:00-3:30**.** Other times in person, phone or Zoom, just make an appointment at lindeman@fit.edu**.**

Reading Materials

There are many books on diverse sustainability issues; very few are organized as introductory textbooks. The primary book for this course is a classic primer on systems and sustainability:
- Meadows, D. 2008. ***Thinking in Systems: A Primer****.* Publisher: Chelsea Green. Get this book, it is <$30, yet very valuable.

Course readings will also include technical journal articles, government and non-profit reports, and significant current articles from print and web media. These readings and assigned chapters from the books will be posted on Canvas. Students who do this reading build new thinking skills and get better grades on tests and HW. Additional references may include:
- Brown, L. 2009. *Plan B 4.0.* Norton Publishers, New York. (The entire book is available in pdf form at: http://www.earth-policy.org/images/uploads/book_files/pb4book.pdf)

- The Brundtland Report. 1987. *Our Common Future: The Report of the World Commission on Environment & Development.* Oxford Press, 400 pp.
- Schor, J. and B. Taylor, eds, 2002. *Sustainable Planet: Solutions for the Twenty-first Century.* Beacon Press, Boston, 273 pp.
- Many other recent articles from the growing literature on sustainability theory and applications.

Grading

25% Homework Late assignments lose 25% of point value per day late.
45% Test 1 and Test 2
30% Final Exam
Final percentages may vary slightly based on how the semester proceeds.

In-Class Protocol

Below applies to face-to-face, or remote learning, or hybrid mixtures.
- The reading and written assignments are reasonably short with much potential for compelling learning. Enter class ready to demonstrate full knowledge of any assignment.
- In-class participation is valuable for you and the full class. All students should measurably contribute to class discussions.
- Good notetaking is essential to excel. What is being said matters, lecture materials not on slides will occur on tests.
- Cell phones are not to be used in the classroom. Please turn your phone off before entering and put phones away in the classroom, students report that they focus and retain better. If there is an extraordinary need to briefly use your phone in a class, contact me before.
- Please do not bring food into the class, plan lunch or snacks accordingly.
- Absences can affect your course grade. Attendance on-time is expected and only fair to the others. Please consult with me, early, if there is an issue.

Since 1990, I've taught science classes, this protocol is fair and ensures *all* get their money's worth in the limited time we have each week.

Personal Protective Equipment (PPE)

In accordance with "Florida Tech Safe: Return to Learn" procedures, instructors will enforce Florida Tech's mandatory face-covering policy in all classrooms. All students MUST wear appropriate face coverings that cover their mouths and noses during all face-to-face course meetings. Students who fail to comply with this policy WILL BE REQUIRED to leave the classroom immediately. Students who are unable to comply may contact Dean of Students Rodney Bowers for further options.

Recording of Classes and Laboratory Exercises

This course may be recorded for use by students or faculty. Enrolled students are subject to having their images and voices recorded during the classroom presentations, laboratories, remote access learning, and online course discussions. Course participants should have no expectation of privacy regarding their participation in the class. Recordings may not be reproduced, shared with those not registered in the course, or uploaded to other online environments. All recordings will be deleted at the conclusion of the academic term.

Plagiarism

- Do not do this for many reasons. Know the academic policy in your Student Handbook: https://www.fit.edu/policies/student-handbook/standards-and-policies/academic-honesty/. Stay free and clear of these avoidable mistakes; they are usually pretty obvious, even before using TurnItIn. These matters can or will involve the Dept. Head and the Dean of Students.

Course Schedule

Wk 1
- Introduction: Fundamental Terms and Concepts; Our Social Capital
- Sustainability Concepts and Terms II; Governance and Scales of Decision-Making

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

Wk 3
- The Arrival of Mass-Consumerism: Below the Surface
- Feedback Loops, Consumption Patterns, and Socio-Ecological Consequences

Wk 4
- Climate and Energy: Intro to Geophysics, Greenhouse Gases, Data-based Interpretations
- Climate and Energy: Deeper into the Data: Past, Present, Future

Wk 5
- Energy and Climate: Fossil Fuels
- Energy and Climate: Alternative Energy Options and Business as Usual

Wk 6
- Energy and Climate: Market Alternatives and Future Governance
- Test 1

Wk 7
- Test Review; Climate and Economics; The Stern Report and Other Business Literature
- Systems Science continued: Why Systems Surprise Us

Wk 8
- Economics: Externalities, Ecosystem Services, and Total Valuation
- Supply-Side Sustainability Tools

Wk 9
- Demand-Side Sustainability Tools, incl. Certifications
- Comparing SS and DS Tools, More Real-world Examples

Wk 10
- Measuring Sustainability: Indicators and Certifications
- Systems Tools and the Springing of System Traps

Wk 11
- Communication and the Realities of Processing Complex Information
- Messaging: Sustainability and Climate Science Examples

Wk 12
- Springing Systems Traps: The Paradox of Growth
- Test 2

Wk 13
- Test Review; Systems Interconnectivity among Primary Sustainability Challenges
- The Consumerism-Climate-Governance Nexus

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

Wk 15
- Sustainability Messaging: Using Relational Frames when Decomposing Complexity
- Class Discussion

Wk 16
- Course Closure and Discussion
- Final Prep.

Wk 17 Finals Week
- Final Exam

This schedule may be subject to change according to breaking issues and opportunities.

Student Learning Outcomes

- Increased knowledge of the conceptual history and logic of sustainability practices.
- Increased understanding of systems thinking tools and the decomposition of complexity.
- Increased understanding of real-world applications of current sustainability principles.
- Recognition of uncertainty envelopes and constraints on predictive knowledge.
- Ability to discuss common sustainability issues from multiple perspectives.
- Experience with the measurement of sustainability: utilizing indicators and other tools.
- 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.
- Improved critical reading and writing skills within both scientific and policy documents.
- Messaging skills needed to deliver scientific information to popular audiences.
- Experience in abstract theoretical evaluation of sustainability challenges and solutions.

TITLE IX

What is Title IX? Title IX of the Educational Amendments Act of 1972 is the federal law prohibiting discrimination based on gender under any education program and/or activity operated by an institution receiving and/or benefiting from federal financial assistance. Behaviors that can be considered sexual discrimination include sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct, and gender discrimination. You are encouraged to report these behaviors.

Reporting. Florida Tech can better support students in trouble if we know about what is happening. Reporting also helps us to identify patterns that might arise – for example, if more than one complainant reports having been assaulted or harassed by the same individual. Florida Tech is committed to providing a safe and positive learning experience. To report a violation of sexual misconduct or gender discrimination, please contact Fanak Baarmand, Title IX Coordinator, at 321-674-8885 or fbaarman@fit.edu.

Please note that your professors, TAs, and other officers of the University are required to report any incidences to the Title IX Coordinator. *Confidential support for students is available through the Student Counseling Center at 321-674-8050.*