

CSUS 300
Theoretical Foundations of Sustainability

Spring 2018
Monday and Wednesday, 12:40 — 2:00 p.m.
223 Natural Resources Building

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Catalog Course Description: Foundations of sustainability theory. History and evolution of interdisciplinary thought about sustainability. Principles of systems thinking as applied to complex problems. Application of theory in community systems.

Course Learning Outcomes: Students who complete this course will:

1. Demonstrate the ability to frame complex problems from a systems perspective.
2. Distinguish between and connect functional integrity and resource sufficiency as global perspectives on sustainability.
3. Describe and demonstrate understanding of evolutions in the thinking about sustainability in various disciplinary/theoretical contributions (economics, ecology, ethics, epistemology).
4. Discuss sustainability critically as a wicked problem, drawing from two or more paradigms for sustainability.
5. Explain the importance to sustainability of embracing multiple knowledge cultures/ways of knowing.

These course outcomes support the Department of Community Sustainability undergraduate program competencies of critical thinking, systems thinking, and ethics. Successful completion of this course provides students with the background needed to frame complex problems and address them systemically in order to successfully complete additional courses in the major. Students can learn more about the Department of Community Sustainability undergraduate program competencies at http://www.csus.msu.edu/undergraduate/sustainability_core. In addition, this course supports Michigan State University's Undergraduate Learning Goals of analytical thinking and integrated reasoning. More information about MSU's Undergraduate Learning Goals is available at <http://learninggoals.undergrad.msu.edu/>.

Course Overview: This course will introduce students to bodies of theory in systems thinking and modeling that provide foundations for understanding, pursuing practical objectives of, and researching new approaches to sustainability. Sustainability requires integration of theory and methods from a number of different scientific disciplines. The course will emphasize the role of stock and flow systems modeling as it has been developed for applications in economics, ecology, and natural resource management. Sustainability modeling will be discussed in connection with views on the role and function of scientific models, on the one hand, and ethical worldviews, on the other. Students will learn to develop non-quantitative stock and flow models of systems and to discuss how system structure does and does not contribute to the sustainability of the system in question.

Course Methods: We will rely heavily on reading and class discussion of materials that articulate and analyze the key theoretical concepts and perspectives noted above. We will also use case studies as ways to both motivate and explore the implications of different theoretical approaches to sustainability. In addition, a series of in-class exercises will demonstrate complexities of key systems. Student performance will be evaluated in accordance with the activities discussed below under **Grading**.

Required Materials:

Books:

- 1) D. Meadows. 2008. *Thinking in Systems: A Primer*. White River Junction, VT: Chelsea Green Publishing
- 2) P. Jacques, 2015. *Sustainability: The Basics*. New York: Routledge

Film:

Terry Jones. 2015. Boom, Bust, Boom. (Available through many streaming video sites for a fee or purchase as a DVD)

Students need to obtain access to these three materials, and must accept responsibility for doing so. Other required materials will be posted on the CSUS 300 Desire to Learn (D2L) site (<https://d2l.msu.edu>).

Suggested Text:

Ulrich Grober, 2012. *Sustainability: A Cultural History*. Devon, UK: Green Books

This non-required text is suggested for students who wish to supplement their reading in the class. Grober covers the history of sustainability and discusses applications in energy, forestry and climate change.

Grading:

<u>Grading Scale:</u>	Grade	Percentage
	4.0	93 - 100%
	3.5	87.5 - 92.9%
	3.0	82.5 - 87.4%
	2.5	77.5 - 82.4%
	2.0	72.5 – 77.4%
	1.5	67.5 – 72.4%
	1.0	62.5 – 67.4%
	0.0	under 62.4%

Assessment:

Out of Class Work	25%
Midterm Examination	25%
Final Examination	25%
Preparation & Participation	25%

Out-of-class work: Homework (50 points possible) Homework is written work to be done outside of class and consists of seven equally weighted assignments worth 10 points each. Homework assignments will be posted on D2L. Some assignments will be based on work being discussed in class and some will require additional out of class research. With the exception of Homework 6, homework assignments will be submitted through D2L. Your grade for homework will be based on the best five grades you receive (e.g. you can “drop” the two lowest grades). Submission of homework assignments after the assigned deadline will result in a reduction of 1 point for each 24 hours beyond the deadline. So, for example, the grade for an assignment due but not submitted by 12:00 p.m. on January 17 would be reduced by 1 point so long as it is submitted by 12:00 p.m. on January 18. After that, the grade will be reduced by 1 more point (total of 2) so long as it is submitted by 2:00 p.m. on January 19, et cetera. Homework that is more than five days late will not be accepted.

Online Discussions (50 points possible): Six discussion rooms will be run on D2L. #1 1/8 – 1/22. #2 1/22 – 2/5. #3 2/5 – 2/19. #4 2/26 – 3/14. #5 3/19 – 4/2. #6 4/2 – 4/18. To earn points in a discussion room make posts that *either* a) respond to one of the prompt questions in the discussion room, b) makes a comment on a post that has already been made by another student or c) initiates a new discussion thread with a thoughtful comment that follows the rules listed below.

The rules: Be respectful and constructive in all posts. **You must make at least two (2) posts during the period that the room is open in order to earn full credit.** Your first post to the discussion room must be made during the first five days that the discussion room is open. Your second post must be at least 24 hours after the first post. Posts should normally be in the range of 100-200 words (much longer than tweets), and posts of less than 50 words will not be counted toward the two post minimum. All posts must be your own words (no pasting blocks of copied text)!

Your grade for each online discussion will be based on the following scale: *Highly Substantive:* 10 points—two or more posts that do a very good job of addressing the point under discussion, and in the case of a reply that makes a constructive and helpful comment (critical or not) that builds upon someone’s earlier post (Building upon someone else’s post is more than just “I agree with...”. You can agree, but your argument needs to add something, not just duplicate what was already written.); *Adequate:* 8.5 points—two or more posts that are on point and are consistent with all the above rules. *In the ballpark:* 7 points—two or more posts that are recognizably addressing topics related to the class and are consistent with the above rules; *No, not really:* 5 points—two or more posts of at least 50 words expressing a meaningful thought in the English language. *Not playing by the rules:* 2 points—only one post during the period. No credit will be given for posts made after the discussion room has been closed or that fail to be respectful and constructive. Students who make two posts but fail to post in the first five days will have one point deducted from your grade from the discussion room. Your course grade for online discussions will be based on the best five grades for each discussion room, (e.g. you can “drop” the lowest grade).

Midterm and Final Exams: Each worth 100 points, to be done in class on Feb. 21 and April 30. [12:45-2:45 pm final exam week] respectively. If you must miss an exam, please inform the instructor as soon as you are aware of the conflict so that appropriate arrangements or accommodations can be made.

Preparation and Participation: This component of the grade will be broken down as follows:

- **General Attendance (20 points possible):** Participation and interaction with other students is a required component of this class. It is impossible to fulfill this requirement if you are not present for class meetings. Attendance will be taken each class day except January 8 and on days when prepared discussions, examinations or quizzes are given. Students who have three absences or fewer will receive all 20 possible points. 1 point will be deducted from the 20 point total for each absence in excess of three. **NOTE WELL:** The three day grace period is expected to cover university excused absences including illness, family emergencies and university sanctioned activities such as student clubs, organizations or activities associated with other classes. It is also expected to cover absences that occur because of late enrollment in the class, and other exigencies that students experience throughout the semester. There will not be exceptions to this policy except in extremely unusual circumstances. If you anticipate problems complying with this requirement, *notify the instructor as soon as you become aware of the problem!* It is not necessary to notify instructors or present excuses for specific absences, they *will not* be reflected in the D2L gradebook.

ALSO NOTE: Michigan State University is committed to ensuring that the bereavement process of a student who loses a family member during a semester does not put the student at an academic disadvantage in their classes. In many cases the 3 day grace period for absences will accommodate for bereavement. However, if you require a grief absence, you may complete the "Grief Absence Request" web form (found at <https://www.reg.msu.edu/sitemap.aspx?Group=7>) *no later than one week* after knowledge of the circumstance. I will work with you to make appropriate accommodations so that you are not penalized due to a verified grief absence.

- **Prepared Discussions (60 points possible):** Four class days are organized as "Prepared Discussions" (Jan. 24; Feb. 14; Mar 21 and April 4). On any of these days, you can earn up to 20 points by coming to class and demonstrating that you are prepared to participate actively in the discussion. Come to class with **2 copies** of the notes that you have made to prepare. One will be turned in at the beginning of class; the second is for your use. Grades for prepared discussions will be based on your 3 best performances (i.e., you can "drop" the lowest prepared discussion grade).
- **Quizzes: (20 points possible):** Five unannounced multiple choice quizzes will be administered during the semester (5 points each). Your course grade for quizzes will be based on the best four grades (e.g. you can "drop" one quiz grade). Quizzes are intended to incentivize reading of assigned material, rather than comprehension or mastery of concepts or completion of key learning objectives. As such, no special preparation for quizzes should be necessary. In order to be prepared for quizzes, students should read materials assigned for each class session and should briefly review readings within 24 hours before coming to class to refresh your memory. If you find yourself having trouble with quizzes, feel free to contact the instructor for a consultation, but also consider making use of the MSU Learning Resource Center: <http://lrc.msu.edu/> Many students who are accustomed to scanning webpages need to develop better reading skills and the Learning Resource Center can help.

Technology Use: While in class, students should put their cell phones to silent or turn them off. Also, sending and receiving text or e-mail messages during class are distracting to students and instructors. Instructors may call out students who are using their phones excessively during class and ask them to stop. Please be aware that others in class behind you can see the screens on your computers and avoid displays that could be distracting to them, either because of content, bright colors or excessive movement (e.g. videos).

Accommodations for Students with Disabilities: Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities at 517-884-RCPD or on the web at rcpd.msu.edu. Once your eligibility for an accommodation has been determined, you will be issued a Verified Individual Services Accommodation ("VISA") form. Please present this form to an instructor during the second week of class and/or two weeks prior to the accommodation date (test, project, etc.). Requests received after this date may not be honored.

Academic Integrity: [Article 2.III.B.2](#) of the Academic Freedom Report states: “The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards.” In addition, the Department of Sustainability adheres to the policies on academic honesty specified in General Student Regulation 1.0, [Protection of Scholarship and Grades](#); the all-University Policy on [Integrity of Scholarship and Grades](#); and [Ordinance 17.00](#), Examinations.

Therefore, unless authorized by your instructor, you are expected to complete all course assignments, including homework, tests and exams, without assistance from any source. You are expected to develop original work for this course; therefore, you may not submit course work you completed for another course to satisfy the requirements for this course. Also, you are not authorized to use the www.allmsu.com Web site to complete any course work in this course. Students who violate MSU regulations on Protection of Scholarship and Grades will receive a failing grade in the course or on the assignment.

Instances of plagiarism constitute academic dishonesty and will result in a grade of zero for the assignment in which plagiarism occurs. See <https://www.msu.edu/unit/ombud/academic-integrity/plagiarism-policy.html> for a definition and discussion of plagiarism.

Faculty are required to report all instances in which a penalty grade is given for academic dishonesty. Students reported for academic dishonesty are required to take an online course about the integrity of scholarship and grades. A hold will be placed on the student's account until such time as the student completes the course. This course is overseen by the Associate Provost for Undergraduate Education.

Mandatory Reporting on Relationship Violence and Sexual Misconduct: All non-student employees of Michigan State University are required to report incidents of or information relating to relationship and sexual violence to the Office of Institutional Equity and MSU Police. They are required to report incidents of or information relating to sexual harassment to the Office of Institutional Equity. Your course instructors *may not* exercise discretion or judgment on these matters. Further information on this policy is available at: <http://titleix.msu.edu/files/documents/mandatory-reporting-guide.pdf>

Citations and references: The APA format should be used for any in-text citations and reference lists when you rely on information from other sources for writing homework assignments. A good reference site for APA style can be found at <https://owl.english.purdue.edu/owl/resource/560/01/>.

Course Schedule:

Date	Topic	Assignment Due
Mon 1/8	Introductions, review syllabus, class expectations; <i>Online discussion room #1 opens, closes Jan. 22</i>	READ: the class syllabus
Wed 1/10	What should we expect from a theory of sustainability? Easter Island case study	Read: Jacques, <i>Sustainability</i> , pp. 1-34 Watch: <i>Easter Island in Context</i> (link on D2L)
Wed 1/17	Dust Bowl case study	Read: Jacques, <i>Sustainability</i> , pp. 146-200 Homework #1 due;
Mon 1/22	Transporting oil case study Prepared discussion #1 <i>Discussion Room 1 closes</i> <i>Online discussion room #2 opens, closes Feb. 5</i>	Read on D2L: Rittel and Weber: Dilemmas in the General Theory of Planning Read on D2L: T. Roelofs, “Oil and water: Searching for truth on the Mackinac pipeline” Watch on D2L: Bomb trains: the crude gamble of oil by rail Pipeline nation: American’s broken industry
Wed 1/24	Systems thinking Part I Prof. Stephen Gray	Watch on D2L: What is Fuzzy Cognitive Mapping? Watch on D2L: How to Use Mental Modeler Check out Mental Modeler

		Read on D2L: Ethics and the spotted owl controversy Read: Meadows, pp. 1-7
Mon 1/29	Systems thinking, Part II	Read: Meadows, pp. 11-72
Wed 1/31	Systems thinking, Part III	Read: Meadows, pp. 75-141 Homework #2 due
Mon 2/5	Systems thinking, Part IV <i>Online discussion room, #3 opens, closes Feb. 19.</i>	Read on D2L: Prugh and Assadourian, "What is sustainability anyway?" Read: Jacques, <i>Sustainability</i> , pp. 35-60
Wed 2/7	Systems Thinking Part V	Read Meadows, pp. 145-165 Homework #3 due
Mon 2/12	Systems Thinking Part VI	Read on D2L: B. Wynne, "Sheepfarming after Chernobyl: A case study in communicating scientific information"
Wed 2/14	Ways of Knowing Part I Prepared Discussion # 2	Read on D2L: G Ryle, "Knowing How and Knowing That"
Mon 2/19	Ways of Knowing Part II	Read on D2L: Kingsland: "Ecological science and practice" Read on D2L: Whyte, Brewer and Johnson, "Weaving indigenous science, protocols and sustainability science"
Wed 2/21	Mid-term Exam	
Mon 2/26	How ecology views sustainability, Part I <i>Online discussion room #4 opens; closes March 14</i>	Read on D2L: "Growth rate," "Maximum Sustainable Yield", "Sustainable Yield," and "MSY"
Wed 2/28	How ecology views sustainability, Part II	Watch on D2L: "How Wolves Changed Rivers" Read on D2L: "Ecosystems"; M. Jonsson, "Biodiversity loss and the functioning of ecosystems;" and "Has Reintroduction of Wolves Really Saved Yellowstone?" Homework #4 due
Mon 3/12	How ecology views sustainability, Part III	Read on D2L: Callicott and Mumford;
Wed. 3/14	How economics views sustainability, Part I: What is Capital?	Read on D2L: G. West, from <i>Scale</i> , "The Big Picture" Read on D2L: M. Common and S. Stagl, "The economy"
Mon 3/19	How economics views sustainability, Part II: GDP <i>Online discussion room #5 opens; closes April 2</i>	Read on D2L: J. Hecht, "Concepts of conventional national income accounting"; J. Rowe, "Our phony economy" Homework #5 due Discussion room 4 closes
Wed 3/21	How economics views sustainability, Part III Weak sustainability vs. strong sustainability Prepared discussion #3	Read on D2L: J. Gowdy and L. Krall, "The fate of Nauru and the global financial meltdown"; Norton, "Valuing ecosystem states,"

Mon 3/26	Sustainability ethics and social justice, Part I	Read on D2L: P. Thompson, "The moral significance of land" Homework #6 due: Bring to Class
Wed 3/28	Sustainability ethics and social justice, Part II	Read: Jacques, <i>Sustainability</i> , pp. 121-145
Mon 4/2	Resource Sufficiency I <i>Online discussion room #6 opens; closes April 18</i>	Read: Jacques, <i>Sustainability</i> , pp. 61-83 Read on D2L: P. Ehrlich & A. Ehrlich, "The population bomb revisited," <i>Discussion room 5 closes</i>
Wed 4/4	Resource Sufficiency II Prepared discussion #4	Read on D2L: H. Daly, "Toward some operational principles of sustainable development"
Mon 4/9	Case # 4: Economic Sustainability and the 2007 Financial Crisis	Watch "Boom, Bust, Boom" by Terry Jones Watch on D2L: "The Crisis of Credit Visualized"
Wed 4/11	Functional Integrity, Part 1	Read: Jacques, <i>Sustainability</i> 84-120
Mon 4/16	Functional Integrity, Part II	Read on D2L: A. Zolli & A. Healy, "The resilience imperative" Homework #7 due
Wed 4/18	Competing Paradigms	Read on D2L: Thompson, "The many meanings of sustainability,"
Mon 4/24	Connecting the Dots	
Wed 4/25	Review for Final Exam	<i>Discussion room 6 closes</i>
Mon 4/30	Final Exam 12:45pm - 2:45pm in 223 Natural Resources Bldg	