

## **CSUS 300** **Theoretical Foundations of Sustainability**

Fall 2019  
Monday and Wednesday, 3:00 – 4:20 pm  
223 Natural Resources Bldg

**Instructor:** Dr. Robert B. Richardson  
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Or by appointment

**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](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:** As the title implies, this course will introduce students to some bodies of theory that provide foundations for understanding, pursuing practical objectives of, and researching new approaches to sustainability. Sustainability is generally understood to require integration of theory and methods from a number of different scientific disciplines. Our approach is to suggest that two paradigms

guide sustainability science today. One is grounded in the debate over limits to economic growth and the indefinite expansion of resource utilization implied by global economic development and increasing human population. Another is grounded in both social and environmental scientists' growing understanding of the fragility and vulnerability of the socio-technical and ecological systems on which human beings depend. These paradigms are not unrelated. Both have been influenced by the development of general systems theory since World War II. But the first, which we will call *resource sufficiency*, understands systems as engines that generate useful products and services, while the second, which we will call *functional integrity*, sees systems as having intrinsic value, or at least as being important in and of themselves. A possible third way lies in process-oriented adaptations of systems theory: the emphasis is on using systems thinking to better engage and respect participants and affected parties.

**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 **Assessment**.

### Required Materials:

Book:

- Meadows, D. 2008. *Thinking in Systems: A Primer*. White River Junction, VT: Chelsea Green Publishing

This text will be supplemented with required articles and other materials posted on the CSUS 300 Desire to Learn (D2L) site (<https://d2l.msu.edu>).

### Grades:

<u>Grading Scale:</u>	Grade	Percentage
	4.0	93.0 - 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:

Homework	20%
Midterm Examination	20%
Final Examination	20%
Class Participation	40%

**Homework:** (100 points possible) Homework is written work to be done outside of class and consists of five equally weighted assignments worth 20 points each; the grade will be based on your five best homework assignments out of a total of six. 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 activities. Homework assignments will be submitted through D2L.

Submission of homework assignments after the assigned deadline will result in a reduction of 2 points for each 24 hours beyond the deadline. So, for example, the grade for an assignment due but not submitted by 3:00 p.m. on September 12 would be reduced by 2 points so long as it is submitted by 3:00 p.m. on September 13. After that, the grade will be reduced by 2 more points (total of 4) so long as it is submitted by 3:00 p.m. on September 14, etc.

**Midterm and Final Exams:** There will be two exams, each worth 100 points, to be done on October 21 (in class) and December 9 (3:00-5:00pm, 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.

**Class Participation:** The class participation grade will be broken down as follows:

- **General Attendance** (40 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 August 28, November 28 and on days when prepared discussions, examinations or quizzes are given. Students who have three absences or fewer will receive all 40 possible points. 3 points will be deducted from the 40-point total for each absence in excess of three. **NOTE:** 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 the instructor or present excuses for specific absences.

**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" form (<https://reg.msu.edu/StuForms/StuInfo/GriefAbsenceForm.aspx>), which must be submitted before you leave campus. 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" (September 18; October 14; November 6, and November 20). On any of these days, you can earn up to 15 points by coming to class and demonstrating that you are prepared to participate actively in the discussion. Upload **1 copy** of your notes that you have made to prepare for the discussion to D2L and bring **1 copy** of your notes to class for your use in the discussions.

1. *Online Discussions* (50 points possible): Five online discussion forums will be held on D2L. #1 8/28 – 9/17. #2 9/18 – 10/8. #3 10/9 – 10/29. #4 10/30 – 11/17. #5 11/18 – 12/4. 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.** Posts should normally be in the range of 100-200 words, 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.

- *Engagement Checks* (Quizzes) (50 points possible): Five unannounced quizzes will be administered during the semester (10 points each). 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 Collaborative Learning Center: <http://nssc.msu.edu/>. Many students who are accustomed to scanning webpages need to develop better reading skills and the Learning Resource Center can help.

### **Expectations:**

**Citations and References:** All sources of information, data, facts, or ideas presented in written work should be cited, and a list of all cited references should be provided. 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/>.

**Technology Use:** While in class, students should switch their mobile devices to silent or turn them off. Also, sending and receiving text or e-mail messages during class are distracting to students and to the instructor. The instructor may call out students who are using their phones excessively during class and ask them to stop.

Tablets and laptop computers can be helpful learning tools in class. However, use of tablets and computers for checking email or social media, watching videos or playing games is disruptive to the class and detrimental to engagement with course material. The instructor may call out students who are using tablets or computers in ways inconsistent with course activities.

Evidence from psychological research has suggested that the use of electronic devices in the classroom negatively affects the performance of other students within view of the devices, and it also negatively affects student users' ability to track their own ability to learn and understand (for more information about this research, see [Stop Multitasking! It's Distracting Me \(And You\)](#)). A recent study led by MSU researchers found that "even the smartest college students suffer academically when they use the Internet in class for non-academic purposes" (see more at: [Surfing the web in class: Bad Idea](#)).

**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 <https://www.rcpd.msu.edu/>. Once your eligibility for 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 (e.g., exam). Requests received after this date may not be honored.

**Academic Integrity:** Students are expected to adhere to high standards of integrity and honesty. Dishonesty or plagiarism with regard to assignments or examinations will not be tolerated. See the MSU Regulations, Ordinances and Policies Regarding Academic Honesty and Integrity: <https://www.msu.edu/unit/ombud/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](http://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 on the affected assignment. A second violation will result in a failing grade for the course.

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 members 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 the student completes the course. This course is overseen by the Associate Provost for Undergraduate Education.

**Spartan Code of Honor:** “As a Spartan, I will strive to uphold values of the highest ethical standard. I will practice honesty in my work, foster honesty in my peers, and take pride in knowing that honor is worth more than grades. I will carry these values beyond my time as a student at Michigan State University, continuing the endeavor to build personal integrity in all that I do.”

You can find more about the Spartan Code of Honor at <https://honorcode.msu.edu/>.

### Course Schedule:

Date	Topic	Assignment Due / Activity
Wed., Aug. 28	Introductions, expectations  <i>Online discussion room #1 opens, closes Sept. 17</i>	Read: course syllabus
Mon., Sept. 2	University holiday	No class today
Wed., Sept. 4	What should we expect from a theory of sustainability?	On D2L, <u>scan</u> : Theory; Mind map On D2L, <u>read carefully</u> : Scientific theory; Heuristic; Paradigm
Mon., Sept. 9	Easter Island case study	Read on D2L: Prugh and Assadourian, “What is sustainability anyway?”
Wed., Sept. 11	Dust Bowl case study	Read on D2L: Rockstrom et al., “Planetary Boundaries: Exploring the safe operating space for humanity”  <b>Homework #1 due</b>
Mon., Sept. 16	Why is sustainability a wicked problem?	Read on D2L: Rittel and Webber, “Dilemmas in a General Theory of Planning”  <i>Online discussion room #1 closes (Sept. 17)</i>
Wed., Sept. 18	Transporting oil case study  <b>Prepared discussion #1</b>  <i>Online discussion room #2 opens, closes Oct. 8</i>	Read on D2L: T. Roelofs, “Oil and water: Searching for truth on the Mackinac pipeline”  Watch on D2L: <ul style="list-style-type: none"> <li>• Bomb trains: the crude gamble of oil by rail</li> <li>• Pipeline nation: American’s broken industry</li> </ul>

Date	Topic	Assignment Due / Activity
Mon., Sept. 23	Systems thinking, Part I Structure and Behavior	Read: Meadows, <i>Thinking in Systems</i> , pp. 1-34
Wed., Sept. 25	Systems thinking, Part II Structure and Behavior	Read: Meadows, <i>Thinking in Systems</i> , pp. 35-72  <b>Homework # 2 due</b>
Mon., Sept. 30	Systems thinking, Part III Systems Properties	Read: Meadows, <i>Thinking in Systems</i> , pp. 75-110
Wed., Oct. 2	Systems thinking, Part IV System Archetypes	Read: Meadows, pp. 111-141
Mon., Oct. 7	Systems thinking, Part V Leverage Points	Read: Meadows, <i>Thinking in Systems</i> , pp. 145-165  <b>Homework # 3 due</b>  <i>Online discussion room #2 closes (Oct. 8)</i>
Wed., Oct. 9	Ways of Knowing, Part I  <i>Online discussion room #3 opens, closes Oct. 29</i>	Read on D2L: Y. Lambrinidou, “When technical experts set out to ‘do good’: Deficit-based constructions of ‘the public’ and the moral imperative for new visions of engagement”
Mon., Oct. 14	Ways of Knowing, Part II  <b>Prepared Discussion #2</b>	Read on D2L: B. Wynne, “Sheepfarming after Chernobyl: A case study in communicating scientific information”
Wed., Oct. 16	Ways of Knowing, Part III  Exam review	Read on D2L: Whyte et al., “Weaving indigenous science, protocols and sustainability science” Listen on D2L: Radiolab, “Stranger in paradise”
Mon., Oct. 21	<b>Mid-term Exam</b>	
Wed., Oct. 23	How ecology views sustainability, Part I	Read on D2L: “Ecosystems” Read on D2L: M. Jonsson, “Biodiversity loss and the functioning of ecosystems” Read on D2L: E. Marris, “The Legend of the Wolf” Review on D2L: Overview, Wolves & Moose of Isle Royale  <b>Homework #4 due</b>

<b>Date</b>	<b>Topic</b>	<b>Assignment Due / Activity</b>
Mon., Oct. 28	How ecology views sustainability, Part II	Read on D2L: Callicott and Mumford, “Ecological sustainability as a conservation concept”  <i>Online discussion room #3 closes (Oct. 29)</i>
Wed., Oct. 30	How economics views sustainability, Part I: What is Capital?  <i>Online discussion room #4 opens; closes Nov. 17</i>	Read on D2L: M. Common and S. Stagl, “The economy” Read on D2L: K. Raworth, “Why it’s time for doughnut economics”
Mon., Nov. 4	How economics views sustainability, Part II: The economy	Read on D2L: J. Talberth, “Measuring what matters: GDP, ecosystems, and the environment” Read on D2L: J. Rowe, “Our phony economy”  <b>Homework #5 due</b>
Wed., Nov., 6	How economics views sustainability, Part III: Weak sustainability and strong sustainability  <b>Prepared discussion # 3</b>	Read on D2L: J. Gowdy and L. Krall, “The fate of Nauru and the global financial meltdown”
Mon., Nov. 11	Sustainability ethics and social justice, Part I	Read on D2L: D. Griggs et al., “Sustainable development goals for people and planet”
Wed., Nov. 13	Sustainability ethics and social justice, Part II	Read on D2L: P. Thompson, “The moral significance of land”  <i>Online discussion room #4 closes (Nov. 17)</i>
Mon., Nov. 18	Resource Sufficiency I  <i>Online discussion room #5 opens; closes Dec. 4</i>	Read on D2L: P. Ehrlich & A. Ehrlich, “The population bomb revisited” Read on D2L: A. Trewavas, “Malthus foiled again and again”
Wed., Nov. 20	Resource Sufficiency II  <b>Prepared discussion #4</b>	Read on D2L: H. Daly, “Toward some operational principles of sustainable development”

Date	Topic	Assignment Due / Activity
Mon., Nov. 25	Functional Integrity, Part I	Watch (per instructions): “Boom, Bust, Boom” by Terry Jones Watch on D2L: TED talk: William McDonough on Cradle-to-Cradle Design
Wed., Nov. 27	Functional Integrity, Part II	Read on D2L: A. Zolli & A. Healy, “The resilience imperative” Read on D2L: A. Leopold, “Thinking like a mountain”  <b>Homework #6 due</b>
Mon., Dec. 2	Competing Paradigms	Read on D2L: P. Thompson, “The many meanings of sustainability”
Wed., Dec. 4	Connecting the Dots  <i>Online discussion room #5 closes</i>	Read: Meadows, <i>Thinking in Systems</i> , pp. 166-185
Mon., Dec. 9	<b>Final Exam: 3:00pm - 5:00pm</b>	

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