

Term Information

Effective Term Spring 2020

General Information

Course Bulletin Listing/Subject Area Anthropology
Fiscal Unit/Academic Org Anthropology - D0711
College/Academic Group Arts and Sciences
Level/Career Graduate
Course Number/Catalog 7004
Course Title Social-Ecological Systems
Transcript Abbreviation Soc-Ecolog Systems
Course Description This course provides an overview of frameworks, theories and methods used in the interdisciplinary study of social-ecological systems, including complexity theory, complex adaptive systems, resilience, institutional analysis, ecosystem services, and coupled human and natural systems. Students will also learn how to effectively collaborate in interdisciplinary studies of social-ecological systems.
Semester Credit Hours/Units Fixed: 3

Offering Information

Length Of Course 14 Week, 12 Week, 8 Week, 7 Week
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? No
Grading Basis Letter Grade
Repeatable No
Course Components Seminar
Grade Roster Component Seminar
Credit Available by Exam No
Admission Condition Course No
Off Campus Never
Campus of Offering Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites
Exclusions Not open to students with credit for ENR 7704.
Electronically Enforced Yes

Cross-Listings

Cross-Listings This course is cross-listed with ENR 7704.

Subject/CIP Code

Subject/CIP Code 45.0201
Subsidy Level Doctoral Course
Intended Rank Masters, Doctoral

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Understand the role of conceptual frameworks in shaping research on social-ecological systems.
- Critically assess different theoretical frameworks that have been used to describe and explain the dynamics of social-ecological systems.
- Critically assess different modeling approaches that have been used to examine the dynamics of social-ecological systems.
- Apply systems thinking to analyze human-environment interactions as social-ecological systems.
- Develop a theoretical model for their own study of human-environment interactions.
- Foster effective collaborations in interdisciplinary teams that analyze social-ecological systems.

Content Topic List

- Complexity theory
 - complex adaptive systems
 - resilience
 - institutional analysis of social-ecological systems
 - ecosystem services
 - coupled human and natural systems
- No

Sought Concurrence

Attachments

- ANTH 7004 Syllabus.docx: 7004 Syllabus
(Syllabus. Owner: Freeman,Elizabeth A.)

Comments

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Freeman,Elizabeth A.	04/05/2019 10:26 AM	Submitted for Approval
Approved	McGraw,William Scott	04/05/2019 11:05 AM	Unit Approval
Approved	Haddad,Deborah Moore	04/05/2019 11:17 AM	College Approval
Pending Approval	Nolen,Dawn Vankeerbergen,Bernadette Chantal Oldroyd,Shelby Quinn Hanlin,Deborah Kay Jenkins,Mary Ellen Bigler	04/05/2019 11:17 AM	ASCCAO Approval

ANTH 7004

SOCIAL-ECOLOGICAL SYSTEMS

Dr. Mark Moritz
Moritz.42@osu.edu
4058 Smith Laboratory
Tel. (614) 247-7426

Spring 2021
Meeting times: TBD
Location: TBD
Office hours: TBD

COURSE DESCRIPTION

This course provides an overview of frameworks, theories, concepts, and methods used in the interdisciplinary study of social-ecological systems. We will cover a wide range of conceptual frameworks, including complexity theory, complex adaptive systems, resilience, institutional analysis of social-ecological systems, ecosystem services, and coupled human and natural systems. We will critically analyze these frameworks and examine how they have been used to study human-environment interactions. The goal of the course is that students draw from these conceptual frameworks to develop a conceptual model for their own study of human-environment interactions. Students will also learn how to effectively collaborate in the interdisciplinary study of social-ecological systems.

COURSE GOALS

The goal is to train students to think theoretically about human-environment interactions as social-ecological systems, in which processes within and feedbacks between human and natural systems are critical for understanding the non-linear dynamics and emergent outcomes. This entails that students should be able to:

1. Understand the role of conceptual frameworks in shaping research on social-ecological systems.
2. Critically assess different theoretical frameworks that have been used describe and explain the dynamics of social-ecological systems.
3. Critically assess different modeling approaches that have been used to examine the dynamics of social-ecological systems.
4. Apply systems thinking to analyze human-environment interactions as social-ecological systems.
5. Develop a theoretical model for their own study of human-environment interactions.
6. Foster effective collaborations in interdisciplinary teams that analyze social-ecological systems.

OFFICE OF DISABILITY SERVICES STATEMENT

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

MENTAL HEALTH STATEMENT

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614 -292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at 614 -292- 5766 and 24-hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1- 800 -273-TALK or at suicidepreventionlifeline.org.

TITLE IX STATEMENT

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu

DIVERSITY STATEMENT

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected

status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

COMMITTEE ON ACADEMIC MISCONDUCT STATEMENT

All students should become familiar with the rules governing academic misconduct, especially as they pertain to plagiarism and cheating. Ignorance of the rules is not an excuse and all alleged cases of academic misconduct will be reported to the Committee on Academic Misconduct (COAM).

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

EVALUATION

1. Participation in class discussion. Students are expected to be actively engaged in class; that is, coming to class prepared, paying attention, and contributing to discussions and problem solving, both by making comments and by facilitating other peoples’ participation. Everyone is responsible for making the seminar an effective learning activity. This entails not only talking, but also listening and encouraging others to participate. Because of the nature of the course and the importance of discussion, *attendance at every class meeting is required*. Students should contact me if there is an emergency situation. In case of illness and absence, students are responsible for obtaining the notes and assignment information from a classmate.

2. Facilitating class discussion. Each week, one or more students will facilitate the discussion in class. Students will sign up for a topic at the beginning of the semester and the instructor will provide tips and suggestions on facilitating group discussions in the first week. The student(s) who lead discussion will begin by briefly summarizing the week’s readings, stating the authors’ main ideas, and outlining potential discussion questions.

3. Online reflections and discussion questions. Students who are not leading discussion on a given week will be required to submit online reflections and at least two discussion questions. The reflections should be about one-page, single-spaced and can discuss the following: strengths and weaknesses of approaches; how it builds on other frameworks; and whether and how it is useful for your own study of human-environment interactions. The online reflections and discussion questions must be submitted every week before the first class.

4. Peer review. Students will review the final paper of another group (see details on final paper below). Peer reviewers should give critical and constructive feedback that will allow the authors to improve their final paper. Students will use peer review instructions from the journal of Ecology and Society (or a comparable interdisciplinary journal).

5. Final Paper – The final project...

- must be a group paper with at least two authors (to provide experience writing in teams);
- at least one person in the group has to have a different disciplinary background (to provide experience with interdisciplinary collaboration and communication);
- can be on any topic that falls within the umbrella of social-ecological systems – e.g., the research question of a particular group member, or a topic of shared interest for which there is sufficient information in the literature;
- must include at least two different frameworks/perspectives discussed in class
- must include a background section explaining your research goals and the ;theoretical perspectives you will employ. You should build on this by identifying the systems involved and their interactions. You should either apply an existing SES conceptual approach or design your own approach to understand the interactions between groups.
- will be between 15-20 pages and will be written in two drafts. The first draft will be peer reviewed (not graded by the instructor) (to give practice with the peer review process).

6. Reflective essay. Students will write a reflective essay in which they discuss the collaborative process of writing the final paper together. In the essay students will discuss specific challenges that they faced in the process of writing the paper, e.g., with language differences/jargon, epistemological differences, different perspectives on the most appropriate analytical scale(s) and how they overcame these challenges (or not). The reflective essay should focus on the process of interdisciplinary collaborations.

Evaluation: Course responsibilities will be weighted in the following way:

1. Participation in class discussions	15%
2. Facilitating class discussion	15%
3. Online reflections	30%
4. Peer review	10%
5. Final paper	20%
6. Reflective essay	10%
Total	100%

Final grades are based on the OSU Standard Scheme. A general guide to how you are doing is: A 93; A- 90-92; B+ 87-89; B 83-86; B- 80-82; C+ 77-79; C 73-76; C- 70-72; D+ 67-69; D 60-66; E< 60.

COURSE SCHEDULE AND SAMPLE READINGS

Week 1: Introduction to conceptual frameworks

- Ravitch, Sharon M., and Matthew Riggan. 2012. Reason & Rigor: How conceptual frameworks guide research. Los Angeles (CA): Sage.
- Agar, Michael. 2004. We Have Met the Other and We're All Nonlinear: Ethnography as a Nonlinear Dynamic System. *Complexity* 10 (2):16-24.
- Henrich, Joseph, Steven J. Heine, and Ara Norenzayan. 2010. Most people are not WEIRD. *Nature* 466 (1 July 2010):29.
- Shore, Zachary. 2016. How to Read & How to Critique in Grad School Essentials: A crash course in scholarly skills. Berkeley (CA): University of California Press.

Week 2: Systems thinking

- Loorbach, D., Frantzeskaki, N., & Avelino, F. (2017). Sustainability Transitions Research: Transforming Science and Practice for Societal Change. *Annual Review of Environment and Resources*, 42, 599-626.
- Rappaport, Roy A. 1971. Ritual, Sanctity, and Cybernetics. *American Anthropologist*. 73(1): 59-76
- Excerpts from Meadows, Donella H. 2008. Thinking in Systems: A Primer. Chelsea Green Publishing.

Week 3: Interdisciplinary collaborations

- Bosque-Pérez, Nilsa A., P. Zion Klos, Jo Ellen Force, Lisette P. Waits, Kate Cleary, Paul Rhoades, Sara M. Galbraith, Amanda L. Bentley Brymer, Michael O'Rourke, Sanford D. Eigenbrode, Bryan Finegan, J. D. Wulfhorst, Nicole Sibelet, and Joseph D. Holbrook. 2016. A Pedagogical Model for Team-Based, Problem-Focused Interdisciplinary Doctoral Education. *BioScience* 66 (6):477-488.
- McGreavy, Bridie, Laura Lindenfeld, Karen Hutchins Bieluch, Linda Silka, Jessica Leahy, and Bill Zoellick. 2015. Communication and sustainability science teams as complex systems. *Ecology and Society* 20 (1).
- Miller, T. R., T. D. Baird, C. M. Littlefield, G. Kofinas, III F. Chapin, and C. L. Redman. 2008. Epistemological pluralism: reorganizing interdisciplinary research. *Ecology and Society* 13 (2):46.
- Eigenbrode, S.D., O'Rourke, M., Wulfhorst, J.D., Althoff, D.M., Goldberg, C.S., Merrill, K., Morse, W., Neilsen-Pincus, M., Stephens, J., Winowiecki, L. Bosque-Perez, N.A., (2007). Employing Philosophical Dialogue in Collaborative Science. *Bioscience*. 57(1). 55.

Week 4: Complexity and Complex adaptive systems

- Excerpts from Mitchell, Melanie. 2009. *Complexity: a guided tour*. Oxford (UK): Oxford University Press.
- Lansing, J. Stephen. 2003. Complex Adaptive Systems. *Annual Review of Anthropology* 32(1):183-204.
- Agar, Michael. 2004. We Have Met the Other and We're All Nonlinear: Ethnography as a Nonlinear Dynamic System. *Complexity* 10 (2):16-24.
- Excerpts from Lansing, J. Stephen. 2006. *Perfect order: recognizing complexity in Bali*. Princeton (NJ): Princeton University Press.
- Levin, Simon, et al. 2012. Social-ecological systems as complex adaptive systems: modeling and policy implications. *Environment and Development Economics* 18 (02):111-132.

Week 5: Human decision-making and the environment

- Simon, H. A. (1985). Human Nature in Politics: The Dialogue of Psychology with Political Science. *The American Political Science Review*, 79 (2): 293-304
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185, 1124-1131.
- Kahneman, D. (2003) "A Perspective on Judgment and Choice: Mapping Bounded Rationality." *American Psychologist*, 58 (9): 697-720.
- Kahneman, D., & Klein, G. (2009). Conditions for intuitive expertise: a failure to disagree. *American psychologist*, 64(6), 515.
- Gigerenzer, G., Goldstein, D. (1996). "Reasoning the Fast and Frugal Way: Models of Bounded Rationality." *Psychological Review*, 103(4): 650-669.

Week 6: SES Framework

- Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. *Science*, 325(5939), 419-422.
- Leslie et al. (2015) Operationalizing the social-ecological systems framework to assess sustainability. *PNAS*.
- Hinkel et al (2015) A diagnostic procedure for applying the social-ecological systems framework in diverse cases. *Ecology and Society*

Week 7: CHANS Framework

- Liu, Jianguo, Thomas Dietz, Stephen R. Carpenter, Marina Alberti, Carl Folke, Emilio Moran, Alice N. Pell, Peter Deadman, Timothy Kratz, Jane Lubchenco, Elinor Ostrom, Zhiyun Ouyang, William Provencher, Charles L. Redman, Stephen H. Schneider, and William W. Taylor. 2007. Complexity of Coupled Human and Natural Systems. *Science* 317 (5844):1513-1516.
- Moritz, Mark, Sarah Laborde, Sui Chian Phang, Mouazamou Ahmadou, Michael Durand, Alfonso Fernandez, Ian M. Hamilton, Saïdou Kari, Bryan Mark, Paul Scholte, Ningchuan Xiao, and Roland Ziehe. 2016. Studying the Logone Floodplain, Cameroon as a Coupled Human and Natural System. *African Journal of Aquatic Sciences* 41 (1):99-108.
- Spies et al (2014) Examining fire-prone forest landscapes as coupled human and natural systems. *Ecology and Society*.

Week 8: Resilience, vulnerability, and adaptive capacity

- Carpenter, S., Walker, B., Anderies, J. M., & Abel, N. (2001). From metaphor to measurement: resilience of what to what? *Ecosystems*, 4(8), 765-781.
- Folke, C. (2006). Resilience: The emergence of a perspective for social-ecological systems analyses. *Global Environmental Change* 16 (3): 253-267.
- Anderies, J., Folke, C., Walker, B., & Ostrom, E. (2013). Aligning key concepts for global change policy: robustness, resilience, and sustainability. *Ecology and society*, 18(2).
- Walker, B., Carpenter, S., Anderies, J., Abel, N., Cumming, G., Janssen, M., ... & Pritchard, R. (2002). Resilience management in social-ecological systems: a working hypothesis for a participatory approach. *Conservation ecology*, 6(1).
- Olsson, P., Folke, C., & Berkes, F. (2004). Adaptive comanagement for building resilience in social-ecological systems. *Environmental management*, 34(1), 75-90.

Week 9: Ecosystem services

- Biggs, Reinette, Maja Schluter, and Michael L. Schoon, eds. 2015. Principles for Building Resilience Sustaining Ecosystem Services in Social-Ecological Systems. Cambridge (UK): Cambridge University Press.
- Boumans, Roelof, Joe Roman, Irit Altman, and Les Kaufman. 2015. The Multiscale Integrated Model of Ecosystem Services (MIMES): Simulating the interactions of coupled human and natural systems. *Ecosystem Services* 12:30-41.
- Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-Being: Synthesis Washington DC: Island Press.

Week 10: Institutions, collective action, governance, polycentricity

- Berardo, R. & Lubell, M. (2016). Understanding what shapes a polycentric governance system. *Public Administration Review*, 76(5), 738-751.
- Carlisle, K. and Gruby, R. L. (2017), Polycentric Systems of Governance: A Theoretical Model for the Commons. *Policy Stud Journal*. doi:10.1111/psj.12212
- Ostrom, V., Tiebout, C. M., & Warren, R. (1961). The organization of government in metropolitan areas: a theoretical inquiry. *American Political Science Review*, 55(04), 831-842.
- Ostrom, E. (2010). Polycentric systems for coping with collective action and global environmental change. *Global Environmental Change*, 20(4), 550-557.

Week 11: Evolution of social-ecological systems (cultural evolution and cMLS)

- Waring et al (2015) A multilevel framework for sustainability analysis. *Ecology and Society*
- Richerson and Henrich (2012) Tribal social instincts and the cultural evolution of institutions to solve collective action problems. *Cliodynamics*
- Brooks et al (2018) Re-examining Balinese subaks through the lens of cultural multilevel selection. *Sustainability Science*.
- Andrews and Borgerhoff Mulder (2018) Cultural group selection and the design of REDD+: insights from Pemba. *Sustainability Science*.
- Peer-review of paper is due.

Week 12: Political Ecology

- Social-ecological systems, social diversity, and power insights from anthropology and political ecology Author(s): Michael Fabinyi, Louisa Evans and Simon J. Foale Source: *Ecology and Society*, Vol. 19, No. 4 (Dec 2014)
- Turner (2013) Political ecology: an alliance with resilience? *Progress in Human Geography*.
- Turner and Robbins (2008) Land change science and political ecology: similarities, differences, and implications for sustainability science. *Annual Review of Environment and Resources*

Week 13: Modelling

- Smaldino, P. E. (2016). Models Are Stupid, and We Need More of Them. Computational Models in Social Psychology, edited by R. R. Vallacher, A. Nowak, & S. J. Read. Forthcoming in 2016 from Psychology Press.
- Kohler et al. 2007: Historical Socionatural Systems and Models
- Epstein, Joshua M. 2008. Why Model? Journal of Artificial Societies and Social Simulation. 11(412)
- Levin, Simon, et al. 2012. Social-ecological systems as complex adaptive systems: modeling and policy implications. Environment and Development Economics 18 (02):111-132.

Week 14: Synthesis

- The final paper is due in Finals week.

LEARNING OUTCOMES

1. Understand the role of conceptual frameworks in shaping research on social-ecological systems.
 - a. Explain what a conceptual framework is
 - b. Explain how conceptual frameworks shape research
2. Critically assess the different conceptual frameworks that have been used describe and explain the dynamics of social-ecological systems.
 - a. List the main conceptual frameworks
 - b. Explain frameworks, key concepts, and the questions they addressed
 - c. Discuss the strengths and weaknesses of conceptual frameworks
 - d. Describe how the frameworks have shaped other conceptual frameworks
 - e. Compare and contrast different conceptual frameworks
 - f. Explain contributions to the study of social-ecological systems
3. Critically assess different modeling approaches that have been used to examine the dynamics of social-ecological systems.
 - a. Describe different modeling approaches to social-ecological systems
 - b. Discuss the strengths and weaknesses of different modeling approaches
 - c. Explain how modeling contributes to study of social-ecological systems
4. Apply systems thinking to analyze human-environment interactions as social-ecological systems.
 - a. Explain models, concepts and questions of conceptual frameworks
 - b. Identify the components, interactions, and processes in systems
 - c. Apply conceptual tools to describe and explain a social-ecological system
5. Develop a conceptual model for their own study of human-environment interactions.
 - a. Construct their own conceptual model
 - b. Use relevant and appropriate theoretical frameworks
 - c. Articulate clearly and logically their own conceptual model
 - d. Convince reader of importance of topic and rigor of approach
6. Foster effective collaborations in interdisciplinary teams that analyze social-ecological systems.
 - a. Recognize the disciplinary perspectives and expertise of self and other team members.
 - b. Value the disciplinary perspective and expertise of self and other team members.
 - c. Leverage the diversity of the disciplinary perspectives and expertise to analyze social-ecological systems.