AED Economics 4330
The Sustainable Economy: Concepts and Methods

Department of Agricultural, Environmental, and Development Economics
Ohio State University
Spring 2018

INSTRUCTOR: Wei Chen
Office: Room 342, Ag Admin Building
Email: chen.4863@osu.edu
Office Hours: Tuesdays 11:00-12:00 or by appointment

TEACHING ASSISTANT: Xiaochen Zhang
Office: Room 342, Ag Admin Building
Email: zhang.3745@osu.edu
Office Hours: Wednesdays 15:00-16:00 or by appointment

TIME AND LOCATION: Tues & Thurs, 9:35-10:55 Ag Admin Building 108

RECITATION: Students must be enrolled in the recitation section (listed a Laboratory section on the master schedule), which meets on Tuesday from 17:30-18:25pm in A108 (our usual classroom). The recitation section will review material from class, provide some guidance on homework and midterms, and cover additional topics. Attendance is required.

CREDITS AND PRE-REQUISITES: 3 credit hours. Pre-req: AED Econ 4310 (Environmental and Resource Economics) or permission of instructor

DESCRIPTION AND GOALS: This is a core upper-level course in sustainability concepts and methods developed specifically for the EEDS major. It is based on concepts from environmental and resource economics, which are well-established fields of economics, and incorporates concepts from ecological economics, which is a more interdisciplinary field that combines elements of economics and ecology. We will consider sustainability methods used by economists, such as wealth accounting, as well as some methods used largely outside of economics, such as ecological footprint analysis. The unifying theme of the course is reflected in the title: concepts and methods for defining and assessing the sustainable economy.

Defining a sustainable economy requires that we grapple with unresolved questions about the sustainability of our current economic systems. These are some deep questions, including: What are the constraints to economic production and consumption that are imposed by the Earth's ecosystem? What is the trade-offs in terms of the economy, environment, and human well-being that are implied by these constraints? What trade-offs are we willing and able to make as individuals and as a society to achieve a more sustainable economy? What are the best policies, including the right incentives for individuals, firms, communities, and nations, to reach this goal? While there is no single "right answer" to any of these questions, there are key concepts and theories that provide a framework for defining a sustainable economy and tools and methods for evaluating the sustainability of economic activities within a given region (e.g., country or community) or by a specific enterprise (e.g., a private business or public institution). The two main goals for this course are:

> (1) To deepen your understanding of the constraints and trade-offs that are implied by a sustainable economy and the nature of the debate that surround these questions.

(2) To help you gain a critical understanding of the tools and methods used to measure sustainability, including their strengths, weaknesses, and application to evaluate the sustainability of the economy, communities, and individual enterprises.

BACKGROUND: We assume that you already have knowledge of basic microeconomic principles and concepts specific to environmental and resource economics, as well as basic knowledge of sustainability definitions, terms and concepts. These include:

- **Environmental and resource economics:** the efficiency of markets and price mechanisms in allocating scarce resources; sources of market failures, including externalities and public goods; the role of government in correcting market failures; types of environmental policies, including market-based incentives; static and dynamic efficiency of resource use; benefit-cost criterion as a measure of efficiency.

- **Sustainability**: Basic definitions of sustainability, ecosystem services, and measures of human well-being; common sustainability indicators and metrics; global environmental and ecosystem trends, including basic knowledge of the findings of the Millennium Ecosystem Assessment (http://www.millenniumassessment.org/en/index.html).

Familiarity with Excel is a plus, but is not a pre-requisite. You will have ample opportunity to gain knowledge and experience with using Excel through the homework assignments.

WEBSITE: Canvas

READINGS: This is not a standard course and there is no textbook. We will use a number of readings and other resources. The reading list is ambitious so it is very important that you keep up with the readings and do not fall behind. A full reading list will be provided and all readings and other resources are posted on the Canvas website. You are strongly encouraged to keep an environmental and resource economics textbook on hand, so that you can review the relevant economic principles as needed.

GRADING AND ASSIGNMENTS: There will be a variety of assignments to guide your learning:

1. Homework assignments (10% each, 3 total)…………………………………………………………30%
2. Exams (20% each, 3 total, the lowest score will be dropped)……………………………………40%
3. Group presentation…………………………………………………………………………………………20%
4. Reading logs (1% each, 4 total)..……………………4%
5. In-class participation……………………………………………………………………………………….6%

Homework assignments: There are three homework assignments. All assignments involve data analysis (using Excel) and written interpretation of results. The weekly recitation session will provide basic Excel instruction and all assignments will be reviewed in the recitation after they have been graded and returned. The majority of the grade for data analysis portion of the homework will be based on correct use of Excel functions and calculations rather than the correct final answer. More detailed instructions will be provided ahead of the due date. Recitation will be conducted by Xiaochen Zhang and all questions pertaining to homework grades should be routed through him as well.

A note on working together: You are allowed to work together on homework assignments in a small group of up to 3 people. If you choose to work together, there are a few rules that you will need to follow: (i) Indicate clearly on the front-page of your assignment or in the top row of your Excel spreadsheet all the members of your group. (ii) You may work together on the Excel homework to do the calculations, but **each person must turn in their own Excel spreadsheet** with the answers

appropriately filled out. (iii) You may discuss the written questions and your thoughts about how to answer them with your group, but **you must turn in their own DOC/PDF file** and the answers that you write down must be in your OWN WORDS—i.e., do not write the answers as a group and then just cut and paste them into your own homework. Discuss your thoughts with the group and then write your answers in your own words.

See the course schedule for due dates of each assignment. Here is a list of the assignments:
- Assignment #1: Inclusive wealth accounting and test of weak sustainability
- Assignment #2: Ecosystem services trade-off analysis with InVEST model
- Assignment #3: Ecological footprint analysis and test of strong sustainability

Late Submission Policy: All assignments are due in class at **the beginning** of class (9:35am). Electronic copies of the written assignments and data analysis assignments must be submitted to the Canvas website (by the same deadline). **No late** homework will be accepted except emergencies or other well-documented issues.

Reading logs: These will be assigned on a regular basis for selected readings to help you keep up with the readings. You will write these outside of class as you work on a reading assignment. They are due by the beginning of class (9:35am) and must be uploaded electronically to the Canvas dropbox before you come to class. Specific prompts for writing these will be posted on Canvas and announced in class. Reading logs are graded as a check or check-minus with extra credit possible for exceptional responses.

Class participation: Your attendance and participation in class is critical. We expect you to attend every class, ask questions, and regularly participate in class discussions.

Group presentation: Build or join a team with 4-5 people to give a 20-min oral presentation. It should be a case study adopting cost-benefit analysis (or other methods learned in class) based on your own group work. The presentation will be evaluated by the instructor, student audience, and your group members.

Midterm and final exams: All exams are in-class and may include any content from lectures, readings, homework assignments, and in-class activities and discussions. The midterms and final are 20% each. The lowest score out of three will be dropped, or you can choose to take any two of the three. The second midterm will focus on the material covered since the previous exam. The final is accumulative.

Grading: Grades are a weighted average of your performance. Unless revised later to reflect an overall curve, letter grades will be assigned according to the following grading scheme cutoffs:

A 93 %	A- 90 %	B+ 87 %	B 83 %	B- 80 %	C+ 77 %	C 73 %
C- 70 %	D+ 67 %	D 60 %	E 0 %			

ACADEMIC MISCONDUCT: Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. All students are expected to abide by the University's Code of Student Conduct http://studentaffairs.osu.edu/pdfs/csc_12-31-07.pdf). Please refer to the OSU Web site for details on Academic Misconduct (http://oaa.osu.edu/coam.html). The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise

the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's Code of Student Conduct is never considered an "excuse" for academic misconduct, so I recommend that you review the Code of student Conduct and, specifically, the sections dealing with academic misconduct. Any violation of the University's policy will be dealt with according to University procedures.

DISABILITY SERVICES: Any student who feels he/she may need an accommodation based on the impact of a disability should contact me privately to discuss to discuss his/her needs.