Course Description
This course surveys research on the quantitative economic analysis of sustainable development, with an emphasis on integrated assessment methods and models and their application to agriculture and rural development policy, agricultural technology impact assessment, and climate change impact assessment. The objective is to provide students with knowledge of basic concepts and methods as well as an introduction to research frontiers. The course is based on selected reading, lectures and a research paper. The course begins with a review of sustainability concepts and their quantification. The second section develops the micro-economic foundations of economic-environment interactions, and uses these concepts in analysis of technology impact assessment, greenhouse gas mitigation and ecosystem service supply. The final section discusses aggregation of site-specific analysis, and linkages to partial and general equilibrium market-level analysis at regional, national and global scales.

Topics
1. Sustainable Development: Concepts and Measurement
   a. Sustainability concepts and indicators
   b. Alternative analytical approaches: benefit-cost, non-market valuation, and tradeoff analysis
   c. Capital concepts, irreversible investment and resilience
   d. Poverty, vulnerability and sustainable livelihoods
   e. Implications for policy design and analysis

2. Economic-environment interactions and technology impact assessment
   a. Economic models of heterogeneous populations
      i. Site-specific models and spatial heterogeneity
      ii. Temporal dynamics
      iii. Population models
   b. Linkages to environmental models
      i. Process-based models
      ii. Statistical models
   c. Applications
      i. Technology impact assessment
      ii. Climate change impact assessment
      iii. Greenhouse gas mitigation and ecosystem services

3. Aggregation and market equilibrium
   a. Exact and statistical aggregation
   b. Linkages from spatially-explicit firm-level models to market models
   c. Partial and general equilibrium policy models
   d. Applications (trade policy, climate change)
**Student learning outcomes**

By the end of this course, students should be able to confidently address a range of problems that focus on the economic and policy dimensions of sustainable development, using thought processes and analytical techniques introduced through lectures and grounded in applications, readings, and class assignments. In particular, students should be:

- Conversant in basic microeconomic theory as applied to sustainable development, welfare analysis, advanced production theory, risk and uncertainty, and market failures
- Able to utilize theory in applications to real world problems and analysis;
- Able to critically evaluate applied economic and sustainable development research focusing on tradeoffs among competing uses of limited resources, technological change, and adaptation to changing climates and production conditions;
- Aware of limitations and needed extensions that arise in applications to real world problems and policy settings; and
- Able to effectively engage with the general public on economic dimensions of issues related to the specific topics covered in this course.

**Grading Criteria**

Two exams and a required paper/research proposal. Grades will be based on performance on the exams, the presentation/proposal including an oral presentation of the research/proposal, and selected readings and homework. Each exam will count equally (25%), paper/research proposal and presentation (40%), and homework/class participation (10%). The grading scale will be 400+points = A, 350-399 = B, 300-349 = C, 250-299 = D, below a 249 = F.

**Statement Regarding Students with Disabilities**

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

**Expectations for Student Conduct (cheating policies):**

Oregon State University defines academic dishonesty as: “An intentional act of deception in which a student seeks to claim credit for the work or effort of another person or uses unauthorized materials or fabricated information in any academic work.” Academic dishonesty includes: Cheating, Fabrication, Assisting, Tampering, Plagiarism. More information, including the process by which academic dishonesty cases are handled, is available at: [http://oregonstate.edu/admin/stucon/achon.htm](http://oregonstate.edu/admin/stucon/achon.htm)