**Meeting the Global Sustainability Challenge**

**THINK 40**

**Winter Quarter 2016**

Mon Wed 1:30 – 2:20pm

Room 320-220

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| **Professors** | **Office & Hours** | **Contact** |
| Pamela Matson | By appointment | pamela.matson@stanford.edu; sfrench@stanford.edu (Susan French, for appointments) |
| Margot Gerritsen | By appointment | [gerritsn@stanford.edu](mailto:gerritsn@stanford.edu) |
| **Lecturers** |  |  |
| Liz Carlisle | Wed 2:30-3:30 & by appt. Cubberley Cafe, (basement of the Graduate School of Education) | [lizwc@stanford.edu](mailto:lizwc@stanford.edu) |
| Angela Harris | Thurs 2-3pm. 218C Sweet Hall | [angelaharris@stanford.edu](mailto:angelaharris@stanford.edu) |
| Andy Lyons | Mon & Wed. 11:00-12:00, and by appt. 343 Y2E2 | [ajlyons@stanford.edu](mailto:ajlyons@stanford.edu) |

# Course Description

The term “sustainability” is popping up everywhere. Businesses, cities, non-governmental organizations, individuals, and universities such as Stanford use the term to characterize decisions that make sense for the well-being of people as well as the environment. Beyond popular use of the term, however, is an emerging field of study that focuses on the goals of sustainable development—improving human well-being while preserving Earth’s life support systems (i.e., our air, water, climate, and ecological systems) across generations —and explores how multiple disciplines can contribute to solutions for some of the most critical problems of the 21st Century.

This course engages students in the critical thinking characteristic of sustainability science, which focuses its attention on solving sustainability problems in the context of coupled social-environmental systems. Within this framework, we will examine some of the major problems of sustainable development and will grapple with the challenges of “intergenerational well-being,” –balancing the needs of current as well as future generations. We will explore questions about and approaches for making trade-offs and avoiding unintended consequences of particular decisions, and we will consider how time and space scales influence those trade-offs. We will consider how human value systems influence sustainability. The evaluation of our questions will involve different kinds of knowledge, from multiple scientific disciplines as well as from multiple kinds of experience. In asking these types of questions, we will encourage new perspectives on the critical nature and complexity of sustainability challenges, and the need for integrative solutions that make sense for the long term.

## Structure

This course follows several major conceptual issues in sustainability science: systems thinking; analysis of social-environmental systems (including scale and complexity issues); the role of different kinds of knowledge; the challenges of linking knowledge with action for sustainability (including values issues); and the role of governance systems in enabling sustainability progress. To illustrate the importance of these concepts in very different contexts, the course employs tangible case study examples and panel discussions in three topical modules central to human sustainability (energy, food, and water).

# Learning Goals

## Thinking Matters Learning Goals

Students in all *Thinking Matters* courses will:

* Develop a sense for what a genuine question or problem is, and what it means to think about an important idea with the sort of disciplined, creative, and critical reasoning characteristic of a university-trained mind.
* Develop broad, transportable skills that are required in (almost) any branch of university work, including: analytical, expository writing; careful, critical reading; analytical and critical reasoning; and capacities for effective oral communication including active listening and responsive discussion.

## Course Learning Goals

By the end of the class, students will be able to:

1. Characterize the goals of sustainability efforts in terms of human well-being; understand the factors and assets that determine progress towards well-being; and recognize the potential for interactions, trade-offs and unintended consequences in efforts made for sustainability goals.
2. Articulate the values and interests of different stakeholders involved in sustainability issues.
3. Identify multiple types of knowledge needed to develop sustainable solutions for particular problems.
4. Recognize how temporal and spatial scales (in governance arrangements, ecological and environmental processes, and economic and social conditions) affect sustainable development problems and proposed solutions.

## Course-specific skills

In the process of achieving the course’s overall learning objectives and WAYS requirement, students will practice how to:

* Analyze biophysical and social science information about human-environment interactions (including interpreting data in scientific papers)
* Support their ideas with evidence while recognizing and describing counter-evidence
* Assess the strengths and weaknesses of different types of information and propose how multiple disciplines might contribute to sustainability goals
* Effectively communicate to wider audiences the dynamics of complex systems using scientific knowledge, evidence, and reasoned argumentation.

## Ways of Thinking/Ways of Doing Breadth Requirement

This Thinking Matters course satisfies the following WAYS requirement areas:

* **Scientific Method and Analysis.** We will incorporate an exploration of the scientific way of thinking throughout this course. Case studies presented in lectures will highlight how scientific ways of thinking were employed in specific circumstances and how they contributed to sustainable or unsustainable practices. Students will learn to identify scientific research processes in course readings and explain the methods to their peers. In course assignments, students will practice key elements of the scientific method (such as considering current knowledge, questioning research processes, and exploring data sets). Further, students will practice translating scientific research results into information for the general public and for policy-making processes.

# Required Reading

* Links to required readings will be posted to Canvas[[1]](#footnote-1). *Students are responsible* for downloading and printing or saving these articles to their device of choice. All readings are accessible with Stanford Student permissions through the Stanford Library and Google Scholar.
* Students are expected to complete the reading *before* the start of class on the day the reading is assigned. In addition, reading responses are due on days noted on the course calendar (usually on Wednesdays). Unless stated otherwise, reading responses are due at the beginning of lecture. Students are allowed two free "passes" on reading responses during the quarter.

# Assignments and Evaluation

## Workload Expectations

Students are expected to devote at least two hours of preparation out of class for each 50 minutes of class time, both for lectures and sections, for a minimum of eight hours of preparation per week.

The following are required:

* Lecture attendance and participation
* Written assignments and course projects (detailed further below)
* Section attendance and participation, including 3 tutorials (outside-of-class meetings with section leaders) per quarter

## Thinking Matters Assignments

Thinking Matters assignments challenge students to ask authentic and rigorous **questions** that will guide their exploration of a topic. Students apply their questions to a critical analysis of material using approaches appropriate to the scholarly methods modeled in the course -- such as close reading of a literary text or film; consideration of context or history; assessment of ethical or scientific models; and accurate measurement of observable data.

Upon completion of this exploration (reading, assessment, measurement etc.), students develop a **claim** about the topic, connected to the course material and relevant to their guiding questions, in order to articulate a critical perspective in a logical and sustained **argument**.

**Evidence** drawn from the analysis is organized to support the claim and to persuade the reader of the validity of the argument.

Students’ **communication** of the questions, the claim, the argument and the evidence cohere in a **presentation** that conveys the extent to which critical thinking skills have been learned through the assignment.

Evaluation of student work is tied to achievement of standards articulated for each of the four dimensions of the assignment:

* **Questions** developing from a critical engagement with course material and lecture:
  + significant, answerable, penetrating
* **Claim and argument**:
  + analytical, logical, complex, original
* **Evidence** in support of claim or argument:
  + relevant, accurate, sufficient, persuasive, thorough
* **Communication and presentation**:
  + coherent, precise, convincing, easy-to-follow, engaging

## Course Assignments

The course assignments are designed to reinforce course content ideas and give students practice at progressively more sophisticated critical thinking regarding human-environment issues and sustainability science.

Detailed assignment instructions will be given in advance of each assignment.

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| **Assignment** | **Percent of Grade** |
| **Participation** | **20%** |
| *Lecture participation* | *(10%)* |
| *Section participation* | *(10%)* |
| **Reading responses** | **10%** |
| **Dataset exploration assignments**  *Food module*  *Energy module*  *Water module* | **15%**  (5%)  (5%)  (5%) |
| **Civic Engagement Reflection** | **15%** |
| **Sustainability Case Study Analysis** | **40%** |
| *Part 1: background research report* | *(15%)* |
| *Part 2: op-ed first draft* | *(10%)* |
| *Part 3: op-ed final* | *(15%)* |

## Section Participation

*Thinking Matters* courses encourage vigorous intellectual exchange, the expression of various viewpoints, and the ability to speak effectively and cogently. Participation includes but is not limited to in-class discussion. As part of the participation grade, the lecturer may assign activities and written assignments such as individual or group presentations, on-line forum entries, current event presentations, lecture summaries, problem sets, debates, etc.

Participation will be evaluated on the following guidelines, which stress the quality rather than the quantity of contributions.

**A range:** The student is fully engaged and highly motivated. This student is well prepared, having studied the assigned material, and having thought carefully about the materials’ relation to issues raised in lecture and section. This student's ideas and questions are substantive (either constructive or critical); they stimulate class discussions. This student listens and responds respectfully to the contributions of other students.

**B range:** The student participates consistently in discussion. This student comes to section well-prepared and contributes regularly by sharing thoughts and questions that show insight and a familiarity with the material. This student refers to the materials discussed in lecture and shows interest in other students' contributions.

**C range:** The student meets the basic requirements of section participation. This student is usually prepared and participates once in a while but not regularly. This student’s contributions relate to the texts and the lectures and offer a few insightful ideas but do not help to build a coherent and productive discussion.

Failure to fulfill satisfactorily the criteria for participation will result in a grade of "D" or below.

# Course Policies

***Thinking Matters* Attendance Policy**

Attendance at lectures and sections is mandatory. If a student has a prolonged illness, varsity athletic competitions, or a personal situation that might lead to more than two section absences, the student should contact his or her Teaching Fellow before missing section. Under certain conditions (such as varsity athletic competitions or prolonged illness), a student may be provided an opportunity to make up the work missed in section. In other words, make-up work is at the discretion of the instructor. Note: insufficient section attendance will result in failure of the course.

**Assignments**

Failure to complete any one graded assignment will result in a failing grade for the quarter. Late assignments will be penalized by ½ grade per day.

**The Honor Code**

Violating the Honor Code is a serious offense, even when the violation is unintentional. The Honor Code is available at: <http://www.stanford.edu/dept/vpsa/judicialaffairs/guiding/honorcode.htm>. You are responsible for understanding the University rules regarding academic integrity; you should familiarize yourself with the code if you have not already done so. In brief, conduct prohibited by the Honor Code includes all forms of academic dishonesty, among them copying from another’s exam, unpermitted collaboration and representing as one’s own work the work of another. If you have any questions about these matters, see your post-doctoral fellow during office hours.

**Provost’s Statement concerning Students with Disabilities**

Students who have a disability which may necessitate an academic accommodation or the use of auxiliary aids and services in a class must initiate the request with the Office of Accessible Education’s Disability Resource Center (DRC). The DRC will evaluate the request with required documentation, recommend appropriate accommodations, and prepare a verification letter dated in the current academic term in which the request is being made. Please contact the DRC as soon as possible; timely notice is needed to arrange for appropriate accommodations (phone 723-1066; TDD 725-1067)

**FERPA**

The Student Record Privacy Policy may be found at <http://studentaffairs.stanford.edu/registrar/students/ferpa>

1. <http://canvas.stanford.edu/> [↑](#footnote-ref-1)