

SI 614/AOSS 605
Prof. [Paul N. Edwards](#) and Prof. [Richard Rood](#)
University of Michigan, Winter 2015
Tuesday 1-4 PM, 1265 North Quad

CLIMATE CHANGE INFORMATICS

Syllabus v 1.0

NOTE: our syllabus is subject to change throughout the semester.

Most current version is always at pne.people.si.umich.edu/PDF/614syll.pdf

The challenge of global climate change presents crucial issues that demand the expertise of both scientists and information professionals. Among these are:

- Retrieving and presenting complex climate data to non-expert users with specific needs
- Building decision-support tools for policymaking, natural resource management, and carbon accounting
- Communicating climate science to broader audiences through simulations, games, or educational software
- Establishing reputation and trustworthiness for web-based information sources
- managing vast Earth system datasets, including curation, provenance, metadata, openness and reproducibility
- Designing green IT, such as power-aware computing, smart controllers and smart grids

This project-based course — team-taught by professors from the School of Information (SI) and Atmosphere, Ocean, and Space Sciences (AOSS) — brings SI and AOSS masters students together to help solve real-world problems with real clients.

This year's projects — all based in Ann Arbor — focus on improving the usability of climate data for problems related to the Great Lakes region. One example: tools designed to help city and regional planners understand likely future climate patterns and their effects on the vulnerability of people and ecosystems. Another project might develop a platform for visualizing, regriding, and making use of climate simulation data.

Early course sessions will introduce the issues surrounding climate change and climate data usability. The remaining weeks of the course will be devoted to group projects. Students will work in teams of 4-5

Prerequisites: SI 582 or 520 or 601/618, or permission of the instructor. Knowledge of any of the following tools and languages is helpful but not required: Python, Django, R, ArcGIS, MATLAB, SAS, and/or Java. We need many different skills, including HCI, information analysis and retrieval, web design, science communication, project

management, and/or climate science — but you need not be an expert in order to join the course.

Learning objectives

Students in this course will learn to:

- Understand fundamental issues in climate change informatics, including numerical modeling, integrated assessment modeling, and climate data access, usability, and quality
- Understand the benefits and drawbacks of climate projections based on simulations
- Understand the range of impacts on human societies and natural environments, and the related range of users and uses of climate change information
- Find, analyze, and visualize a variety of climate data
- Evaluate and improve the usability of climate data systems

Requirements and assignments

- ***Class participation*** (20 percent of course grade). This is a group projects course. Its success depends on the full commitment and involvement of *all* participants. You will be graded on both the regularity and the quality of your participation. “Participation” includes working with your project group on a full and equal basis.
- ***Attendance***. Missing more than 2 course sessions during the semester will negatively affect your final grade, since you will not have participated as fully as others.
- ***Group project*** (80 percent of grade). Working in groups of 3-5, students will develop one of the term projects in a series of 5 milestones:
 - Scope and problem definition (10 percent) - Feb 10
 - Usability interviews and design/redesign brainstorm (15 percent) - Feb 24
 - Prototype (re)designs (15 percent) — March 17
 - Usability walkthroughs, evaluation, and final (re)design plans (15 percent) — Mar 31
 - Final (re)design, user evaluation, and project report (20 percent) — April 25