COURSE SYLLABUS

Climate Change Adaptation: Perspectives at the Nexus of Science, Society, and Resource Management

RNR 440 - 540

COURSE DESCRIPTION: Much of modern society’s experience of managing resources and protecting people and infrastructure has occurred during a period of relatively stable climate. In the most recent decades in the Southwest, we have observed a cascade of impacts associated with temperature increases, including changes in snow hydrology, in phenology, and in the severity of drought impacts. Projected future climate changes and impacts may lie outside the range of climate variation that we have observed and may have more serious consequences for society and the environment. Anticipating changes will allow society to identify response options across a range of vulnerabilities and manage the risks associated with projected climate changes. In the best possible cases, these actions, or adaptations, may provide economic and other benefits to society.

In this 3 credit course, we will examine actions to reduce vulnerabilities or increase resilience to the potential impacts of climate change. Each of the class sessions is designed to include thought-provoking presentations by practitioners, land managers, and researchers – in order to ground state-of-the-art science and theory with on-the-ground realities. While the general focus will be on impacts and responses in the arid Southwest (water, fire, species, ecosystems), we will also investigate the tools, philosophies, and frameworks for advancing action and incorporating adaptation planning at the local, regional, national and international scale.

The course is open to graduate students and to seniors from relevant academic programs, with the permission of the instructors.

TIME: Thursdays, 2:00 to 4:30 PM
LOCATION: Environment and Natural Resources Building 2, Room N350

INSTRUCTORS: Gregg Garfin (gmgarfin@email.arizona.edu)
Larry Fisher (lafisher@email.arizona.edu)

FORMAT: Lecture and discussion, including frequent guest presentations by practitioners, land managers, and researchers.

COURSE GOALS: We will explore perspectives on climate change adaptation through a series of topical presentations and discussions. The course will include an exposure to key scientific literature, agency and organizational source material, analytical and planning methods, and numerous project and case studies. The overall goal of the course will be to provide students with a broad perspective of issues related to climate change adaptation, and to identify key themes, important concepts, tools and methods, best practices, and emerging lessons from this experience.
EXPECTATIONS: Registered students should be prepared to:

- Attend all presentations and discussion sessions
- Review all background materials prior to the class sessions
- Participate actively in discussion sessions
- Complete two written assignments (one team and one individual), for selected sessions during the course
- Complete a research paper, project report, or proposal, and make a short presentation of this assignment to the class

REQUIRED READINGS: Two to three core readings per week will be identified and made available electronically (via the course D2L site); optional readings for each topic will be offered for those students interested in further study. Some materials will be distributed as handouts during class sessions.

GRADING: Since the course seeks to cover a broad set of concepts by highlighting applications in a range of program settings, class attendance throughout the semester is mandatory.

For undergraduate students (seniors): Attendance and active participation in class sessions will account for 40% of course grading. Students will select two sessions of particular interest during the semester, and prepare written assignments for those sessions. The writing assignments will consist of: a thematic summary of one of the class sessions, and a case study of one of the three adaptation-relevant tools presented during the class (see below for details). The written assignments will constitute 30% of course grading (15% for each assignment). Students will also identify a research topic, project or policy report, or a project or research proposal to pursue in greater depth during the semester. Topics will be discussed with and approved by the instructors prior to the Spring break. The final written assignment is due on the penultimate session of the semester, and students will be responsible for making a brief presentation to the class during the final class session. The course paper (3,000 words) and final presentation will constitute 30% of course grading.

For graduate students: Graduate students are expected to fulfill all of the expectations for undergraduates outlined above. Graduate students are expected to produce more detailed analyses of their selected session topics, and complete a more in-depth final research paper project report, or proposal (5,000 words). Graduate students should aim to produce a final written assignment that is consistent with the quality of submissions for a professional journal article. Students are encouraged to use the format of a recognized journal in their field. Grading for graduate students will be determined as follows: attendance and participation (30%), session summary and tools case study (30% – 15% each), final paper (40%).

More detail on the written assignments and criteria for grading/evaluation is provided in the Addendum below.
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<th>Week</th>
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<th>Topic</th>
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<td>1</td>
<td>1/14</td>
<td>Organizational meeting, course overview; Practitioners Panel and facilitated discussion</td>
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<td>2</td>
<td>1/21</td>
<td>Overview 1: Climate Variability and Change – global overview and general principles</td>
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<td>1/28</td>
<td>Overview 2: Adaptation theory, practice, and challenges</td>
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<td>2/4</td>
<td>Overview 3: Climate Change in Arid North America – specifics of climate and water in our region</td>
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<td>5</td>
<td>2/11</td>
<td>Overview 4: Politics, policy, and law in climate change</td>
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<td>6</td>
<td>2/18</td>
<td>Climate change, water impacts, and ecosystem management in the Southwest</td>
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<td>2/18 Proposal due</td>
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<td>7</td>
<td>2/25</td>
<td>Ecological Change: Phenology</td>
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<td>8</td>
<td>3/3</td>
<td>Proposals approved</td>
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<td>9</td>
<td>3/10</td>
<td>Forest Change: Tree Mortality and Fire</td>
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<td>SPRING BREAK</td>
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<td>11</td>
<td>3/24</td>
<td>Vulnerability Assessment</td>
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<td>3/24 Outline due</td>
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<td>12</td>
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<td>Scenario Planning</td>
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<td>4/7</td>
<td>Developing an Adaptation Plan</td>
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<td>14</td>
<td>4/14</td>
<td>International concerns – US-Mexico border</td>
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<td>15</td>
<td>4/21</td>
<td>International climate governance issues</td>
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<td>16</td>
<td>4/28</td>
<td>Paper due</td>
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<td>4/28 Paper due</td>
<td>Student Presentation Session (5/5 is Reading Day)</td>
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ADDENDUM: CRITERIA FOR EVALUATION/GRADING

1) Attendance and participation
   • Physical attendance at all class sessions.
   • Active engagement in class discussions, including thoughtful questions or comments that advance class discussion.
   • Advance readings and timely completion of all written assignments.

2) Field trips
   • There will be one field trip during the course, to the Las Cienegas National Conservation Area. Participation, while strongly encouraged, is optional.
   • The field trip will be held on a weekend (likely on Saturday), approximately 6 – 8 hours in duration, and scheduled with students during the initial class session.
   • Extra credit (5% of total grade) will be awarded to students participating in the field visit.

3) Thematic summary (team assignment)
   • Students will select one session topic during the second week of class.
   • Instructors will organize students into working groups, and students are expected to work together to complete this assignment.
   • For the selected topic, students will work together to:
     o Review all advance readings and prepare 3 – 5 discussion questions for the session.
     o Lead the discussion session with the prepared questions, in a thoughtful manner that helps the class dive deeply into key issues.
     o Produce a written summary of the topic. The summary should provide a succinct synthesis, highlighting key points from the advance readings, class presentation/s, and discussion.
     o Summaries should be at least 5 pages.

4) Case study (individual assignment)
   • Students will select from the three methods/tool sessions (Vulnerability Assessment, Scenario Planning, Developing an Adaptation Plan) and prepare a case study review for a selected geographic setting (e.g., city, country, reserve).
   • The case study should describe the tool’s application in a particular context, discussing unique uses, challenges, and lessons learned that have wider implications.
   • Length of the case study should be at least 3 pages, and must be submitted within 1 week of the class session for the tool that you have selected.
5) Final research paper, project or policy report, research or project proposal (individual assignment)

- This assignment is intended to provide students with an opportunity to explore a research topic or relevant program or policy issue in greater analytical depth. Students may also choose to use the final assignment as an opportunity to develop a full research or project proposal. However, **the term paper must be a distinct and original piece of writing which addresses a topic relevant to course material.**

- The final paper should provide an in-depth examination of a topic related to climate change adaptation, and framed in terms of critical question(s) or an assessment of a contemporary policy issue or project initiative.

- The topic will be identified by students, based on their individual interests.

- Students are strongly encouraged to meet with instructors to identify topics, and to review proposed topics and outlines.

- Students will submit a proposed topic, including a title and abstract, by Week 6 (18 February).

- Proposals will be reviewed and approved by instructors by Week 8 (3 March).

- Papers should be single-spaced, 12 point Times New Roman.

- Suggested length: undergrads 3,000 words; graduate students 5,000 words.

- Instructor review will be based on content and relevance (30%), critical thinking and analysis (30%), application of key concepts and literature (20%), and strong writing skills (20%). Students are expected to provide appropriate citations and bibliographic references. Writing should be succinct and consistent with the highest standards of scientific writing.
CLASSROOM BEHAVIOR:

- All cell phones and beepers must be turned off prior to entering the classroom. These sounds and conversations distract both students and instructors alike. The sole exception will be for those individuals involved in emergency services.

- While in class, students are expected to conduct themselves in a manner conducive to learning and in a way that does not distract the other students from learning. Respect and common courtesy to fellow students and the instructor is expected.

- The Arizona Board of Regents’ Student Code of Conduct, ABOR Policy 5-308, prohibits threats of physical harm to any member of the University community, including to one’s self. See: http://azregents.asu.edu/rrc/Policy%20Manual/5-308-Student%20Code%20of%20Conduct.pdf.

SPECIAL NEEDS AND ACCOMMODATIONS: Students who need special accommodation or services should contact the Disability Resources Center, 1224 East Lowell Street, Tucson, AZ 85721, (520) 621-3268, FAX (520) 621-9423, email: uadrc@email.arizona.edu, http://drc.arizona.edu/. You must register and request that the DRC send the course instructor official notification of your accommodations needs as soon as possible. Please plan to meet with the instructor by appointment to discuss accommodations and how the course requirements and activities may impact your ability to fully participate. *The need for accommodations must be documented for the DRC.*

STUDENT CODE OF ACADEMIC INTEGRITY: Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: http://deanofstudents.arizona.edu/codeofacademicintegrity

CONFIDENTIALITY OF STUDENT RECORDS: See http://www.registrar.arizona.edu/ferpa/default.htm

SUBJECT TO CHANGE STATEMENT: Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.