



EOS 5xxK

Climate Change and Society in China

Fall 2015

Dates / contact hours: 300 minutes of contact time per week for 7 weeks
Academic Credit: 1 course
Areas of Knowledge: NS (Natural Sciences-Climate Change & Society in China)
Modes of Inquiry: STS (Science, Technology, & Society)
Course format: Lectures and discussions, plus field trip(s) and analysis of weather station data

Instructor's Information

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Prerequisite(s), if applicable

No prerequisite (background in science preferred)

Course Description

This course will cover Earth's climate history and the links between climate and society in China, as well as physical climatology and the future climate in China. Topics include: 1) the global climate system including climate components and their interactions, 2) climate feedbacks, 3) the concept of energy balance, 4) basic circulation of the atmosphere and ocean, 5) hydrological cycle and carbon cycle, 6) the methods of paleoclimate reconstruction, 7) the record of natural variations of past climate with emphasis on past changes of monsoon rainfall reconstructed from paleoclimate archives for the past 10^6 years, 8) results from paleoclimate models, and 9) the extrinsic forcing mechanisms of observed paleoclimatic variations. We will research and discuss the detailed historical record of climate in ancient China, the impact of past climate variability on Chinese society and history, and the future climate of China.

This course is a blend of materials from the two Duke University courses, EOS 508 (Climate History) and EOS 511 (The Climate System), with a special focus on China.

Course Goals / Objectives

Students should be able to understand basic concepts in the areas of climate, climate history, and climate change; read, comprehend, and evaluate primary scientific literature; integrate material from different sources and think synthetically; present material clearly in oral and written formats.

Required Text(s)/Resources

The Earth System by Lee R. Kump et al., Prentice Hall, 3rd Edition, 2009, 420 pages

Recommended Text(s)/Resources

Additional readings (scientific reprints) may be required or recommended and will be posted on the course Sakai site.

Additional Materials (optional)

Laptops or ipads are preferred.

Course Requirements / Key Evidences

Exercises will generally be given on a weekly basis. Unless stated otherwise, assignments will be due a week later at the beginning of the class. Oral presentation will consist of a lecture given by students working in groups on a particular aspect of climate in China. Students will discuss their presentation topic with the professor in advance.

Technology Considerations, if applicable

Sakai will be used for communications with students, uploading scientific papers and lectures, and assignments. Skype may be used to contact world experts on various topics.

Assessment Information / Grading Procedures

The grade in the course is based on assignments (25%), short quizzes (10%), a midterm (25%), a final exam (cumulative 35%), and level of participation (5%).

Specific learning objectives will be aligned with the assignments and projects in the course. Students will receive detailed rubrics for course work so that they understand the criteria for performance and the system for assignment of points for grades.

Diversity and Intercultural Learning (see Principles of DKU Liberal Arts Education)

The course will accommodate students from a variety of background and expertise and will provide a common ground for engaging students from both physical and social sciences background. The course will

provide the students with the opportunity to study climate issues and will explore the students' own interests in climate topics in China. Special attention will be given to the international aspects of the course.

Course Policies and Guidelines

As stated above, the instructor's expectations for all assignments and activities will be made as explicitly as possible, given the likelihood of a wide range of background conventions and habits among the students. The Duke Kunshan University Community Standard will be discussed and adhered to.

ACADEMIC INTEGRITY:

Each student is bound by the academic honesty standard of Duke Kunshan University. Its Community Standard states: "Duke Kunshan University is a community composed of individuals of diverse cultures and backgrounds. We are dedicated to scholarship, leadership, and service and to the principles of honesty, fairness, respect, and accountability. Members of this community commit to reflect upon and uphold these principles in all academic and non-academic endeavors, and to protect and promote a culture of integrity." Violations of the DKU academic honesty standard will not be tolerated. Cheating, lying, falsification, or plagiarism in any practice will be considered as an inexcusable behavior and will result in zero points for the activity.

CLASS ATTENDANCE:

Students are responsible for all the information presented in class. As indicated above, class attendance and participation are important components of the grade. All students are expected to participate during class time.

POLICY ON MAKE-UP WORK/EXAMS:

Students are allowed to make up work only if missed as a result of illness or other unanticipated circumstances warranting a medical excuse, consistent with DKU policy. You must notify the instructor in advance if you will miss an exam or project deadline. Project extensions requested for medical reasons must be negotiated at the time of illness.

The use of cellular phones and laptops is not permitted during the class, except when approved by the instructor.

Students should familiarize themselves with both the DKU and the Duke academic standards, even though they are very similar.

Duke University holds its students to the highest standards of academic integrity and honesty. Academic dishonesty of any kind is not tolerated and might result in failure of the assignment, and/or course, and/or expulsion from the university. Plagiarism on written assignments will result in a zero for the assignment and might result in further disciplinary action through the university. As a Duke student you pledge to uphold the Duke Community Standard:

- I will not lie, cheat, or steal in my academic endeavors;
- I will conduct myself honorably in all my endeavors; and

- I will act if the Standard is compromised.

For more information on academic integrity and the Duke Community Standard see:

http://judicial.studentaffairs.duke.edu/resources/community_standard/cs_more.html

Tentative Course Outline or Schedule

	TOPIC
Week 1	Course overview; Components of the climate system; Feedbacks and interactions
Week 2	Global energy budget (solar radiation, planetary energy budget, greenhouse effect); QUIZ 1
Week 3	Atmosphere and ocean circulation; Regional climate (monsoon climate in China); QUIZ 2; CHOOSE TOPIC FOR ORAL PRESENTATION
Week 4	Hydrological Cycle; Carbon cycle; Weathering; Long-term climate change; MIDTERM
Week 5	Introduction to the paleoclimate toolbox: Climate proxies; Field Trip; ORAL PRESENTATIONS
Week 6	Overview of Earth’s long-term climate history; Climate change hypotheses & major events starting with formation of the atmosphere (Orbital changes & Ice Age climates; Insolation control of monsoons and ice sheets); QUIZ 3
Week 7	Climate variability and change, climate impact and future climate in China; Development alternatives for a more sustainable future; FINAL EXAM

I will conduct a survey of student interests and backgrounds before the course begins and use that information as a basis for adjusting the number of topics covered and the depth of material that will be presented. The list of topics as outlined is ambitious because it is drawing material from two different courses (EOS 508 and EOS 511). The array of topics may be adjusted to accommodate student interests and the seven-week format, and to provide the best academic experience for the students.

(Version for DKU Ad Hoc Committee)