Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. This request is submitted by the Department of Geography

2. Course prefix, number and complete title of course: GEOG 642 Past Climates

3. Catalog Course description (not to exceed 50 words): Terrestrial and marine proxy records of past climate variability, including tree rings, coral, and sediments; past climate change events such as the Little Ice Age and Medieval Warm Period; greenhouse gases and global temperature; insight into the nature of climate change and challenges humankind faces in the next few centuries.

4. Prerequisite(s): Graduate classification

Cross-listed with: GEOS 642

Cross-listed courses require the signature of both department heads.

5. Is this a variable credit course? ☑ Yes ☐ No If yes, from _____ to _____

6. Is this a repeatable course? ☐ Yes ☑ No If yes, this course may be taken _____ times.

Will this course be repeated within the same semester? ☑ Yes ☐ No

7. Has this course been taught as a 489/689? ☑ Yes ☐ No If yes, how many times? _____

Indicate the number of students enrolled for each academic period it was taught.

8. This course will be:

a. required for students enrolled in the following degree programs(s) (e.g., B.A. in history)

b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

M.S. or Ph.D. in the College of Geosciences

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix Course # Title (excluding punctuation) GEOG 642 PAST CLIMATES

<table>
<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
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<th>Admin. Unit</th>
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Approval recommended by: [Signature]

Department Head - Type Name & Sign

Date

[Signature]

Chair, College Review Committee

Date

[Signature]

Dean of College

Date

[Signature]

Dean of College

Date

Submitted to Coordinating Board by:

[Signature]

Date

Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
PAST CLIMATES (GEOG 642)
Fall 2010

Instructors: Mitch Lyle
Office: Room 411B O&M
Office Hours: TBD
Phone: 979-845-3380
Email: mlyle@ocean.tamu.edu

Brendan Roark
Room 811 O&M
TBD
979-862-1775
broark@geog.tamu.edu

Class Meeting Time and Place: TBD

Online Course Information: http://elearning.tamu.edu/

COURSE DESCRIPTION

Earth’s climate has warmed and cooled well before humans started to influence climate. Modern instrumental climate records only go back 100-150 years. How do we know what Earth’s climate was like in the past? Past climate variability is key to understand how climate works and how it can change in the future. Many earth systems respond on time frames longer than the instrumental record and cannot be studied without making use of natural recorders (proxies) of past climate variations in marine and terrestrial archives. This course will survey some of the terrestrial and marine proxy records of past climate variability, including tree rings, coral, and sediments. The course will discuss how natural recording systems have different abilities to measure climate variations on different time scales, ranging from annual and millennial scale resolution over different temporal scales (e.g. Little Ice Age) to lower resolution (e.g. Milankovitch cycles). The course will also emphasize that linking models, modern instrumental data and paleoclimate observations provide better insight into the nature of climate change and the challenges human kind faces the next few centuries. A number of key concepts will be addressed including (1) The basic physics and chemistry of the climate system remain constant although the past climates may not resemble modern conditions; (2) Earth systems are interlinked in the process of climate change; (3) There are different modes of climate variability operating on different time scales; (4) the current instrumental record is far too short to understand these modes of variability, and (5) Rapid climate change has occurred in the past and understanding these climate thresholds or tipping points are critical to addressing climate changes of the near future. The course will also compare current human impacts to past climate changes to show that the potential human impacts on climate are significant even compared to past climate perturbations.

PREREQUISITES

In order to enroll in GEOG 642, the student must be a graduate level student.
COURSE EVALUATION: GEOG 642

1 Midterm 30%
1 Lead one group presentation 10%
8 Journal paper summary and review 20%
1 Final term paper 30%
Prepare and present one lecture 10%

The grading system follows the Texas A&M University grading system:
A = Excellent
B = Good
C = Satisfactory
D = Passing
F = Failing

Grades will be assigned based on the following cutoffs: A = > 90%, B = 80-89%, C = 70-79%, D = 60-69%, F = <60%. When final grades are calculated there might be a curve applied that affects all student grades, but the curve would only raise, not lower all grades.

Midterm will be a short answer and essay question exam focused on the lecture and reading material.

Group presentation will consist of ~3 students presenting a journal paper or article expanding on the current state of knowledge of a lecture topic. As the course is stacked with GEOG 442, each group will be lead by one graduate student responsible for setting up the background information, undergraduate students will be responsible for presenting methods and results of the paper. The entire group will be responsible for summarizing and leading a class discussion of the important outcomes of the paper.

The journal paper summary and review will be an ~1 page summary and review of the important outcomes of the paper, followed by a discussion of its importance within the context of the weekly lecture topics. Graduate students will be responsible for 8 reviews.

Graduate student final term paper (~12-15 pages) will be a review and discussion of open questions based on class topics as they relate to the students areas of research. This paper will be written in a similar fashion a hypothesis driven research proposal.

Graduate student lecture presentation will be done in consultation with the professors with the expectation that the presentation will increase the students’ familiarity with the topic to be covered. The student will be assessed on the accuracy, clarity and overall quality of the presentation.

COURSE MATERIALS
Reading assignments will focus on recent scientific journal articles related to the lecture topics and student presentations. Additional background reading will be assigned from the following text.

Past Climates – syllabus
IPCC Fourth Assessment Report


**SCHEDULE of LECTURE TOPICS, READINGS, EXAMS, and PRESENTATIONS**

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**FIELD TRIPS**

Two field trips will be scheduled to give the students some exposure to some of the archives and analytical instrumentations used in paleoenvironmental reconstructions.

Fieldtrip 1: We will visit the Light Stable Isotope Analytical Facility (corals and tree rings examples) and the Williams Radiogenic Isotope Geosciences Laboratory. Examples of coral and tree ring archives will be shown and discussed.

Fieldtrip 2: We will visit the Integrated Ocean Drilling Program (IODP) core repository to see examples of how ocean sediment cores can be used to reconstruct past climate variability.
COURSE AND UNIVERSITY POLICIES

CLASS ATTENDANCE: The University views class attendance as the responsibility of the student. While attendance is not part of your assessment, your performance is directly related to your attendance- the more classes you miss the lower your grade tends to be. Students who miss class are responsible for getting the notes from a classmate.

EMAIL: All Texas A&M students should use their neo email accounts when emailing the instructor or the teaching assistant. I may send out class announcements via the neo email system and it is your responsibility to check your account regularly.

THE AMERICANS WITH DISABILITIES ACT (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu.

COPYRIGHT AND PLAGIARISM POLICY: All materials used in this class are copyrighted. These materials include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless permission is expressly granted.

As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.

If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, http://student-rules.tamu.edu/, under the section "Scholastic Dishonesty."

ACADEMIC DISHonesty: Texas A&M has a Scholastic Dishonesty policy to which both students and faculty must comply. If you have any questions about the University's Scholastic Dishonesty Policy, please review the Student Rules or see me. The Aggie Honor program is the new program that will handle all cases of academic dishonesty. The Aggie Honor program website is located at http://www.tamu.edu/aggiehonor.

"An Aggie does not lie, cheat or steal, or tolerate those who do."

Past Climates – syllabus
PAST CLIMATES (GEOG 442)

Fall 2010

Instructors: Mitch Lyle
Office: Room 411B O&M
Office Hours: TBD
Phone: 979-845-3380
Email: mlyle@ocean.tamu.edu

Brendan Roark
Room 811 O&M
TBD
979-862-1775
broark@geog.tamu.edu

Class Meeting Time and Place: TBD

Online Course Information: http://elearning.tamu.edu/

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PREREQUISITES

The course assumes a fundamental understanding of Earth system science and the fundamentals of climate change. As such, either GEOG 203, GEOL 101 or 104, ATMO 201 or OCNG 251 is required.
COURSE EVALUATION: GEOG 442

1 Midterm 30%
1 Group presentation 20%
4 Journal paper summary and review 20%
1 Final term paper 30%

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The journal paper summary and review will be an ~1 page summary and review of the important outcomes of the paper, followed by a discussion of its importance within the context of the weekly lecture topics. Undergraduates will be responsible for 4 reviews.

The final term paper (~8-10 pages) will be a review and discussion of open questions from a list of topics agreed upon with the professors. This paper will be written in a similar fashion to the introductory section a hypothesis driven proposal.

COURSE MATERIALS

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Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.


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**FIELD TRIPS**

Two field trips will be scheduled to give the students some exposure to some of the archives and analytical instrumentations used in paleoenvironmental reconstructions.

Fieldtrip 1: We will visit the Light Stable Isotope Analytical Facility (corals and tree rings examples) and the Williams Radiogenic Isotope Geosciences Laboratory. Examples of coral and tree ring archives will be shown and discussed.

Fieldtrip 2: We will visit the Integrated Ocean Drilling Program (IODP) core repository to see examples of how ocean sediment cores can be used to reconstruct past climate variability.
COURSE AND UNIVERSITY POLICIES

CLASS ATTENDANCE: The University views class attendance as the responsibility of the student. While attendance is not part of your assessment, your performance is directly related to your attendance—the more classes you miss the lower your grade tends to be. Students who miss class are responsible for getting the notes from a classmate.

EMAIL: All Texas A&M students should use their neo email accounts when emailing the instructor or the teaching assistant. I may send out class announcements via the neo email system and it is your responsibility to check your account regularly.

THE AMERICANS WITH DISABILITIES ACT (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu.

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As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.

If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, http://student-rules.tamu.edu/, under the section "Scholastic Dishonesty."

ACADEMIC DISHONESTY: Texas A&M has a Scholastic Dishonesty policy to which both students and faculty must comply. If you have any questions about the University’s Scholastic Dishonesty Policy, please review the Student Rules or see me. The Aggie Honor program is the new program that will handle all cases of academic dishonesty. The Aggie Honor program website is located at http://www.tamu.edu/aggiehonor.

"An Aggie does not lie, cheat or steal, or tolerate those who do."

Past Climates – syllabus