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## **GEOG442/GEOG642/GEOS442 – Past Climates (F18)**

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**This course will be held from August 27 to December 05, 2018.**

Bi-weekly meetings in CSA303.

Instructions for accessing e-campus are provided at the end of the document.

### **(1) Schedule**

Classes: Tuesdays and Thursdays, 14:20-15:35

Final exam: take-home due on December 09 2018 at 23:59

### **(2) Instructor**

Dr. Julie Loisel, Assistant Professor, Department of Geography, TAMU

**Email:** [julieloisel@tamu.edu](mailto:julieloisel@tamu.edu) Send me your questions or comments via email and I will respond to you within 3 business days (usually much faster than that).

**Office hours:** 10-11am on Tuesdays and Thursdays, room OM803-C.

### **(3) Course overview**

The goal of this course is to provide each student with an introduction of the field of paleoclimatology. The course is divided into 4 main sections: (1) Drivers of climate change, (2) Proxies and Dating methods, (3) Climate since the Last Glacial Maximum, and (4) Case studies (student projects). In the first section, students learn about tectonics-scale and orbital-scale climate forcings. The second section focuses on key archives, methods, and tools used to reconstruct climate change. In the third section, students examine a series of events that have marked the Pleistocene and the Holocene epochs. Lastly, students have the opportunity to explore a time period, an event, a record, or a proxy of their choice; a report and an oral presentation will ensue.

### **(4) Required textbook**

Graduate students are required to read “*Fixing Climate: What past climate changes reveal about the current threat – and how to counter it*” by Wally Broecker and Robert Kunzig. ISBN: 978-0-8090-4501-3. If you prefer not buying a paper copy, you can get it as an e-book or borrow it from a library.

### **(5) Course components**

**Exams:** There are two exams; each of them is worth 15% of your final grade. For the first one, a list of potential questions will be provided one week before the exam

date to help you prepare. The second exam is non-cumulative and open book; you will have until December 9<sup>th</sup> 2018 to complete it.

Exam 1: 10/16/2018 (in class)

Exam 2: 12/05-09/2018 (take home)

Students seeking an excused absence for an exam must notify me in writing at least one week ahead of time. In cases where advance notification is not feasible, you must provide notification as soon as possible, and by the end of the second working day after the absence at the latest. If the absence is considered excused by the university (<http://student-rules.tamu.edu/rule07>), you will be able to make up the missed exam. At my discretion, the make-up exam might be in a different format than the original exam.

**Homework Assignments:** You will be working on a total of 2 homework assignments; each of them is worth 10% of your final grade. These exercises will be posted on e-campus and directly related to topics covered in the lectures and texts. You will submit your assignments through Turnitin (via e-campus). While collaboration between students is encouraged, assignments must be turned in individually. The following deadlines must be observed:

HW01 (paleo reconstruction): due on 11/04/ 2018 at 23:59

HW02 (<sup>14</sup>C calibration): due on 12/02/ 2018 at 23:59

Students who cannot comply with these deadlines must notify me in writing at least one week ahead of time. **Computer issues are not a valid excuse for not turning in an assignment.** Late assignments will be penalized at a rate of 10% per day.

**Discussion lead and class participation:** An important feature of the class is discussion sessions, each one focusing on a key topic. These discussions center on the results from key papers that will be assigned by the instructor. Two or three undergraduate students will be responsible for leading each discussion session; this presentation is worth 10% of your final grade. Everyone is expected to contribute to the discussions; at least 24 hours prior to each discussion, all students who are not assigned to lead that discussion will submit to the instructor 2-3 questions that stem from reading the article. A participation grade (10% of final grade) will be assigned on the basis of those questions and in-class involvement during discussions. The leaders should address the most important questions during the discussion session. Instead of leading discussion sessions, graduate students will be presenting the book by Wally Broecker on September 29<sup>th</sup> during our regular class (10% of final grade). They are expected to participate in all other discussion sections, as stipulated above.

**Final project and presentation:** You will be working on a paleoclimate paper (15%) and presentation (15%). Details will be provided in class. Note that undergraduate and graduate students will be evaluated on the basis of different

criteria. As mentioned above, this is your opportunity to review a time period (ex: Eocene-Oligocene transition), an event (ex: Younger Dryas), a record (ex: Cariaco Basin), a proxy (ex: coral reefs as proxies for sea level changes), a process (ex: bi-polar seesaw), or anything else related to paleoclimate and of interest to you. Approval of topic by instructor required.

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## (6) Learning outcomes and competencies

Learning outcomes pertaining to **Critical Thinking Skills**: (1) apply and understand the fundamental concepts of Earth system science and Paleoclimatology; (2) explain and rationalize how to find, assess, use, and present scientifically credible information; (3) demonstrate the appropriate use of the scientific method (repeatable observations, testable hypotheses, multiple analytical tools, and data interpretation) to explore, describe, and learn about Earth's past climates, (4) analyze paleoclimate datasets and provide interpretations, and (5) explain the manner that Earth's natural archives provide records of our planet's history, and how the principle of uniformitarianism ("the present is the key to the past") allows Earth scientists to reconstruct past landscapes and environments. In terms of **Communication Skills**, students will (6) describe climatic patterns through graphs; (7) write a term paper on a paleoclimate topic of their choosing; (8) discuss methods and results from paleoclimate studies, and (9) articulate their thoughts and questions to the discussion leaders prior to class. Students will develop new **Empirical and Quantitative Skills** via (10) analyzing several types of climatic and geochemical datasets using Excel and other online software.

## (7) University policies

### **Aggie Code of Honor:**

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

<http://aggiehonor.tamu.edu/>

**Academic Integrity:** Texas A&M has an Academic Integrity policy to which both students and faculty must comply. Details about the Aggie Honor Policy can be found at <http://aggiehonor.tamu.edu/>. **The materials used in this course are copyrighted.** These materials include but are not limited to videos, syllabi, quizzes, exams, lab problems, homework assignments, 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. **Plagiarism** is when you pass off someone else's work (language or ideas) as your own. 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 have the permission of that person. For more information, see "Scholastic Dishonesty" under the Texas A&M University Student Rules: <http://student-rules.tamu.edu>.

**Americans with Disabilities Act (ADA):** 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 email me. In addition, contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information, visit <http://disability.tamu.edu>.

## (8) Evaluation and Feedback on assignments and exams

**Grading:** Exam and course grades are not negotiable. Your grade reflects your performance in this course. The grading scale follows the TAMU grading system:

A = Excellent	90-100%	B = Good	80-89%
C = Satisfactory	70-79%	D = Passing	60-69%
F = Failing	00-59%		

### ***Evaluation:***

Exams	15% each	30% of total
Homework assignments	10% each	20% of total
Discussion leader/Book presentation		10% of total
Participation		10% of total
Final Project		30% of total

**Feedback:** You can expect feedback and grades on assignments and exams within about one week of the submission deadline of those said assignments and exams. Grades will be uploaded on e-campus and made available to you.

## (9) Getting started

On page 8, you will find instructions on how to navigate to e-campus and access our course. Once you made it to our course portal, a series of instructional documents will be available to you. Download them on your device for future reference. If you have any further question regarding e-campus, please contact the help desk:

Websites: <http://eCampus.tamu.edu/> <http://hdc.tamu.edu/>  
Email: [helpdesk@tamu.edu](mailto:helpdesk@tamu.edu) Phone: (979) 845-8300

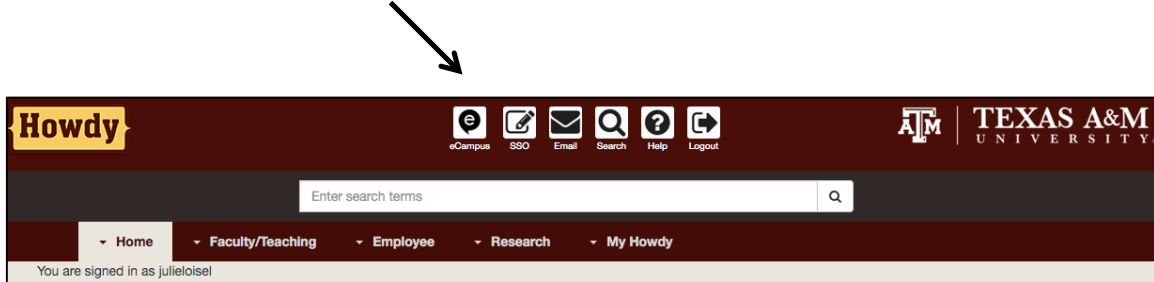
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## (10) Course schedule

TOPIC 1 – DRIVERS OF CLIMATE CHANGE	
T 08/28	Introductions, Motivating questions in paleoclimatology
R 08/30	Overview of Earth's climate system today (lecture)
<b>F 08/31 LAST DAY FOR ADDING/DROPPING A CLASS (until 5pm)</b>	
T 09/04	Tectonic-scale climate change (lecture)
R 09/06	Tectonic-scale climate change (reading/discussion 1)
T 09/11	Orbital-scale climate change (lecture)
R 09/13	Orbital-scale climate change (reading/discussion 2)
TOPIC 2 – PALEOCLIMATE PROXIES & DATING TECHNIQUES	
T 09/18	Paleobotany (lecture)
R 09/20	Paleobotany (reading/discussion 3)
T 09/25	Paleoceanography (lecture)
R 09/27	Wally Broecker's Book: report by graduate students (material part of Exam 1)
T 10/02	Paleolimnology (lecture)
R 10/04	Paleolimnology (reading/discussion 4)
T 10/09	Radiocarbon dating (lecture)
R 10/11	Radiocarbon dating (reading/discussion 5)
T 10/16	<b>Exam 1 (in class)</b>
TOPIC 3 – CLIMATE SINCE THE LAST GLACIAL MAXIMUM	
R 10/18	Presentation on HW01 + Research Project
T 10/23	Last Glacial Maximum (lecture)
R 10/25	CLASS CANCELLED (Loisel in Chicago)
T 10/30	The early-Anthropocene hypothesis (reading/discussion 6)
R 11/01	Younger Dryas (reading/discussion 7) + Presentation on HW02
T 11/06	Heinrich, Dansgaard-Oeschger, and Bond events/cycles (reading/discussion 8)
R 11/08	The 8.2ka and 4.2ka events (reading/discussion 9)
TOPIC 4 – PROJECT PRESENTATIONS	
T 11/13	Student presentations (material part of Exam 2)
R 11/15	Student presentations (material part of Exam 2)
<b>F 11/16 LAST DAY FOR Q-DROP (until 5pm)</b>	
T 11/20	Reading day: Climate change during the last 1000 years
T 11/27	Student presentations (material part of Exam 2)
R 11/29	Student presentations (material part of Exam 2)
T 12/04	Student presentations (material part of Exam 2)
S 12/09	<b>Exam 2 due by the end of day + Final paper due by the end of day</b>

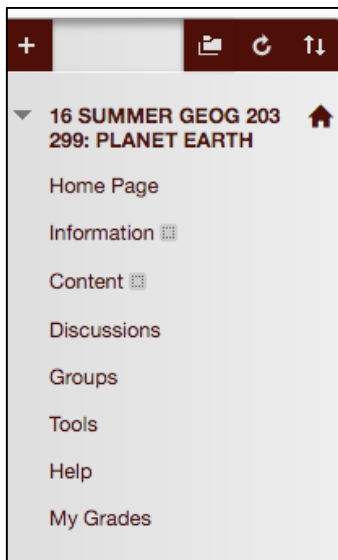
## GEOG-442 Past Climates: Getting Started

1. Go to [www.howdy.tamu.edu](http://www.howdy.tamu.edu)
2. Click on the beige button “Log In with your NetID to get started”
3. Enter your NetID as well as your password, and click on the red button “Log In”
4. Click on the e-campus icon towards the top of your screen



**If you prefer, you could also directly go to [www.ecampus.tamu.edu](http://www.ecampus.tamu.edu) to log in.**

5. Click on “18 FALL GEOG442-GEOS442-GEOG642: PAST CLIMATES”
6. You have now entered our virtual classroom.



Using the menu (shown here), you have access to:

- class **Information** (including the syllabus, course navigation, and several “how to” guides)
- class **Content** (weekly course material)
- the **Discussion** board
- your **Grades**