

**Course Description and Syllabus**  
**Paleoceanography (GEOL 4/54074)**  
**Kent State University**  
**Spring 2006**

**Instructor:** Dr. Joseph D. Ortiz  
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Mailbox: Dept. of Geology Main Office (McGilvrey 221)

**Lecture:** Tuesday/Thursday 3:45-500pm,  
**Location:** McGilvrey Room 234 for lecture or Room 303 for activities  
**Office Hours:** T 9:45-10:30 am, F 2:15-3:05 pm, or by appointment.

**Course Rationale and Objectives:**

**Approach:** Earth's Ocean plays a critical role in climate and maintaining a planet suitable for life. In this class we will explore how the ocean fits into the Earth System and learn how the ocean and earth system have changed in response to internal and external forcing.

**Expected outcome:** Student will gain an appreciation for the systems perspective and will learn how paleoceanographers extract information about past ocean states using data and modeling approaches.

**Pre-requisites:** Interested students should contact the instructor for permission.

**Text:** *Earth's Climate Past and Future*, by William Ruddiman, ISBN 0-7167-3741-8

**On reserve in the student reading room:** Chapters 4 and 6 of *Ocean Circulation*, ISBN 0-08-036369-5.

**Course web site:** TBA

**Office Hours and Consultation with the Instructor:** I want you to do well in this course! I welcome questions from all students either in person, by email, or by phone. Whether you are doing well in the course, find it challenging, or are on academic probation, attending office hours can help make the course a more enriching experience. To ensure your own privacy when sending electronic messages, please use your university email account. Include your first and last name on any electronic correspondence. You should however, include no more than the first five digits of your student ID number (SSN) on any electronic correspondence. Please cc a copy of any important messages that you send to the instructor back to yourself so that you have a record.

**University Policies:** The following University policies apply to anyone enrolled in this course:

1. **Enrollment Status:** Students are responsible for ensuring that they are properly enrolled in their classes. You are advised to review your official class schedule during the first two weeks of the semester and prior to the drop and withdrawal dates to ensure that you are properly enrolled in this class and section.
2. **Academic Honor Code:** All students in the course are expected to abide by the academic honor code, as specified in the University's "Digest of Rules and Regulations". The use of other's intellectual property without giving them appropriate credit is a serious academic offense. This includes misrepresenting the source, nature or other conditions of your academic work to get undeserved credit. It is the University's policy that cheating or plagiarism can result in receiving a failing grade for the work or course or other more serious disciplinary action. Repeat offenses can result in dismissal from the University.

3. Drop and Withdrawal: For Spring 2006, the last day to drop from the class without receiving a grade of "W" is January 29, 2006. The last day to withdraw from the class with a grade of "W" is March 26, 2006. For more information, see the Spring semester withdrawal page on the registrar's web site.
4. Students with disabilities: In accordance with University policy, if you have a documented disability and require accommodations to obtain equal access to this course, please contact the instructor at the beginning of the semester or when given an assignment for which an accommodation is required. Students with disabilities must verify their eligibility through the Office of Student Disability Services (SDS) in the Michael Schwartz Student Services Center (330-672-3391).
5. Final Exam Dates: Please check the final exam schedule for the classes in which you are enrolled. In the event that you have a conflict with another scheduled exam, the instructor will make suitable arrangements. Students who have conflicts or more than three examinations on the same day should consult with the Dean of his or her college at the earliest possible time for assistance in making alternative arrangements.

**Grading Policy:** Students are expected to attend class, do the reading, and consult the instructor throughout the term. These steps will help you to learn the material covered in class on the exams, and in your term paper. Class participation is an important part of this class. If you do not attend class, arrive unprepared, or do not contribute to class discussion, your grades will suffer. Late assignments will be docked 1/3 letter grade per class period. Class participation will allow you to gauge your progress. Grades will be based on a subset of the assigned work as follows:

Three Essay Midterm exams (20% each)	60%
Class Participation	15%
<u>Final Term Paper</u>	<u>25%</u>
Total	100%

**Class Participation and Paleooceanographic Case Studies:** During Weeks 6-10 of the class we will study interesting case histories of past worlds reconstructed through the use of a variety of paleoceanographic data (e.g. physical properties of sediments, microfossils, and geochemical tracers). We will select five of the following topics and explore each for a one week period using the class text and readings from the literature as a guide:

The Snowball Earth	Mountains and Climate
Polar Amplification of Climate	Of Monsoons and People
The Mid-Pleistocene Revolution	Climate Gateways
Abrupt Climate Change	Ice Free Worlds

Students will have the opportunity to vote on which of these topics they would like to study. Each week will consist of a setup lecture by the instructor followed by group discussion of the class based on material from the text and from published papers. For each topic, the instructor will select student teams who will have the responsibility of finding publications on the topic and presenting these to the class for discussion. Readings will thus be: Selected from the class text, handouts provided by the instructor, and provided by student group leaders selected for each topic.

**Final Term Paper:** All classes at Kent State must have a substantive final assessment as part of the grading processes. The Final Term Paper will serve this purpose in Paleooceanography. *Students who do not complete this assignment will not receive a passing grade in the class.* The final class paper will be due before 5 pm on the last class meeting before the beginning of exam week (May 5<sup>th</sup>). Student should begin working on this project by the third week of class and are expected to be prepared to discuss progress on their topic during class and to meet with instructor during the term to seek guidance and

provide progress reports.

**Exams:** Written, in-class exams will test your knowledge of the material. These will include short answer and conceptual essay questions. Remember to write out your answers in a clear methodical fashion and to show all your work.

**Make-up Exams:** Students are expected to manage their academic and personal activities responsibly during the term. Students who miss an exam must provide a legitimate written excuse in a timely manner in order to receive a make-up exam. Legitimate excuses for missing an exam include written documentation for the following: conflict with another Kent State University academic activity (such as an off campus field trip), your own illness, a death in the family, and military or intercollegiate athletic commitments. If you are involved in military or official university athletic activities, review the exam schedule at the beginning of the term and consult with the instructor prior to the exam if you have a conflict. If you have an illness, personal crisis, or family tragedy that results in missing an exam, you must contact the instructor by phone or email no later than 48 hours after the scheduled start time of the exam. It is very important that you provide your name and a telephone number where you can be reached in your phone or email message.

**How grades are calculated:** Grades are based on a weighted average of your class scores using the following equation:

$$\text{Class GPA} = 0.6 * (\text{Average Midterm GPA}) + 0.15 * (\text{Class Participation}) + 0.25 * (\text{Final Term Paper})$$

Your Class GPA is then converted to a letter grade using the table below.

Class GPA	3.71 to 4.30	3.50 to 3.70	3.29 to 3.49	2.71 to 3.28	2.50 to 2.70	2.23 to 2.49	1.71 to 2.20	1.50 to 1.70	1.29 to 1.49	0.50 to 1.28	0
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F

Student who never attend, or stop attending class will receive grades of NF or SF in accordance with university policy.

## Paleoceanography Class Schedule and Reading Assignments

Week	Class Topics	Readings*
<b><u>Part 1- the Ocean's Role in Climate</u></b>		
1	The Earth Systems Approach (Jan 17 & 19)	Chapter 1
2	Radiative Forcing and the Atmosphere (Jan 24 & 26)	Chapter 2
3	Climate Recorders (Jan 31 & Feb 2)	Chapter 3
4	Wind-Driven Circulation (Feb 7 & 9)	Chapter 4, <i>Ocean Circulation</i>
5	Density-Driven Circulation (Feb 14)	Chapter 6, <i>Ocean Circulation</i>
<i>Midterm 1 and Term paper topics and outline due – Feb 16 class period</i>		
<b><u>Part 2- Paleoceanographic Data- A case studies approach</u></b>		
6-10 (Feb 21, 23, 28, Mar 2, 7, 9, 14, 16, 21)		
<p>In this section of the class we will study interesting case histories of past worlds reconstructed through the use of a variety of paleoceanographic data (e.g. physical properties of sediments, microfossils, and geochemical tracers). We will select five of the following topics and explore each for a one week period using the class text and readings from the literature as a guide:</p>		
<p><i>The Snowball Earth</i> <i>Polar Amplification of Climate</i> <i>The Mid-Pleistocene Revolution</i> <i>Abrupt Climate Change</i></p>		<p><i>Mountains and Climate</i> <i>Of Monsoons and People</i> <i>Climate Gateways</i> <i>Ice Free Worlds</i></p>
<p><b>Readings:</b> Selected from the class text, handouts provided by the instructor, and provided by student group leaders selected for each topic.</p>		
<i>Midterm 2 and First Draft of Term Paper - March 23 class period</i>		
<i>(Spring Break March 25 through April 2)</i>		
<b><u>Part 3- Paleoceanographic Modeling – Simulating Lost Worlds</u></b>		
11-12	Box Models – A visit to the ocean of the Last Glacial Maximum (April 4, 6, 11, 13)	Chapter 3 & handouts
13-14	Energy Balance Models and GCMs – Past and Future worlds (April 18, 20, 25, and 27)	Chapter 3 & handouts
15	<i>Midterm 3- May 2 class period</i>	
<i>End of class sessions – Final version of Term Papers due May 5th</i>		

\*Readings from Ruddiman unless otherwise noted. Any changes to the readings will be announced in class.