# Fall 2012 GEOL 4/5/60095 Special Themes: Marine Processes Syllabus
## Kent State University Department of Geology

**Instructor:** Dr. Joseph D. Ortiz
Office: McGilvrey 334/336C
Phone: 330-672-2225
Email: jortiz@kent.edu
Mailbox: Dept. of Geology Main Office (McGilvrey 221)

| **Course Number:** | | **Registrar's CRN Number:** | |
|---|---|---|---|
| Undergrad: | Geol 40095 (Sect. 4) | Undergrad: | 13987 |
| M.S. I Graduate: | Geol 50095 (Sect. 4) | M.S. I Graduate: | 13998 |
| M.S. II Graduate: | Geol 60095 (Sect. 4) | M.S. II Graduate: | 14008 |

**Lecture**
**McGilvrey Room 339** (Unless otherwise noted)
WF 9:15 – 10:30 am

Material is subject to revision as needed; Please check the class website or instructor for additional information.
**Office Hours:** T: 1:00-3:00 pm; W: 10:30-12:00 am; F: 1:00-3:00 pm; or by appointment.

**Course Rationale and Objectives:** The sea is the ultimate repository for material eroded from the continents, plays a critical role in climate change and is integral to the cycling of energy and matter in the Earth System. This special themes course will explore some of the mechanisms (physical, chemical, and biological) thorough, which the ocean operates, and how it influences climate on seasonal, inter-annual, and where applicable, glacial-interglacial times scales. Emphasis will be placed on understanding the relative importance of these processes and how they have varied through time, and the potential outcomes of human induced changes to these processes.

**Learning outcomes for "Special Themes" courses in Geology:** Demonstrate knowledge and an understanding of major concepts and/or theoretical principles in the topic area. Communicate effectively in a variety of formats as appropriate to the topic. Engage in critical discussions about the topic. Use the concepts, language, and major theories of the discipline.

Topics to be covered:

- Ocean basins, sediment distribution and transport
- Properties of sea water
- The wind driven circulation
- Distribution of water masses
- The thermohaline circulation
- Global biogeochemical cycles and nutrient distributions
- Regional Oceanography with emphasis on Arctic Oceanography
- Oceans and climate: Implications for various timescales

**Text and additional resources:**

- **"**Descriptive Physical Oceanography, An Introduction", 6th Edition, 2011
  By Lynne D. Talley, George L. Picard, William, J. Emery, and James H. Swift
  Elsevier, Academic Press, Amsterdam, ISBN 978-0-7506-4552-2

- **Publisher's Online Supplement for Descriptive Physical Oceanography**:
  There are many resources available to assist you as you explore Marine Processes in this course.
  These include Supplementary chapters and Figures, and access to Java Ocean Atlas exercises.
  You can access the text website from the following URL: http://booksite.academicpress.com/DPO/index.php

- **Note:** Additional handouts and resources may be provided during the course of the term.

**Prerequisites and Suggested Courses:** There are no prerequisites for the course, but students are expected to be familiar with calculus, inorganic chemistry, and earth system science. This class will serve as excellent preparation for GEOL 4/54074: Paleoceanography.

# Fall 2012 GEOL 4/5/60095 Special Themes: Marine Processes Syllabus
# Kent State University Department of Geology

**Course web site:** http://www.personal.kent.edu/~jortiz/marineprocesses/
Note that as with all internet resources, access to or availability of the web site cannot be guaranteed. Please use the resources available on the web site in advance of exams.

**Office Hours and Consultation with the Instructor:** I want you to do well in the class! I welcome questions from all students either in person, by email, or by phone. Whether you are doing well in the course, are on academic probation, or think that you may find the course challenging, attending office hours can help make the course a more enriching experience. As instructed by university policy, when sending electronic messages please use your university email account and include your first and last name on any electronic correspondence.

**Grading Policy:** Students are expected to attend class, complete the readings, participate in class discussions, and consult the website throughout the term. These steps will help you to learn the material covered on the exams. There will also be several, group take-home activities assigned during the term. They will allow you to gauge your progress and provide you with credit for class participation. Grades will be based on the assigned work as follows:

| Grading Instrument | Undergraduate | Graduate |
|---|---|---|
| Midterm exams | | |
| (Two exams worth 15% each) | 33.3% | 30% |
| Cumulative Final Exam | 33.3% | 30% |
| Homework/Class Participation | 33.3% | 20% |
| Graduate Term Project | | 20% |
| Total | 100% | 100% |

**Group activities:** Homework for the class will consist of readings and occasional group take home activities. Students are encouraged to discuss the readings with others students in the class before and after class meetings.

**Undergraduate Term Project**: During Week 12 the undergraduates in the class will be split into four groups to conduct a "jigsaw" assignment in which each group is assigned to read and present material on the regional oceanography of a major ocean basis. Each group will have half the assigned class time to present on the regional oceanography of the Atlantic, Pacific, Indian or Southern Ocean.

**Graduate Term Project**: This course will require significant amounts of independent scholarship at the graduate level. Graduate student will be expected to research a particular topic of interest on the syllabus, generate a bibliography of publications from the literature and complete a term paper on the subject. Students will be guided through this process during the term as they complete various stages of the project: (1) Bibliography of sources, (2) description of research question, (3) outline, (4) initial draft, (5) final draft.

**Exams:** Each exam will consist of short answer and essay questions. The questions may involve calculations or the interpretation of maps, diagrams, and graphs. The midterm exams will give students an opportunity to demonstrate their knowledge of the material presented. While the midterm exams will be non-cumulative, the final exam will be cumulative. Exam scores may be curved at the discretion of the instructor, but each student has the potential to succeed in this course. Students are expected to pick up their graded exam papers in class when they are returned, or to make arrangements to do so at office hours.

**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 written excuse no later than 48 hours after the scheduled start time of the missed exam in order to receive a make-up exam. Make-up exams will consist of several essays and short answers that cover the same material as the in-class exam. Legitimate excuses for missing an exam include written documentation for the following: conflict with another official Kent State University activity (such as a 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 an email or phone where you can be reached in your message.

# Fall 2012 GEOL 4/5/60095 Special Themes: Marine Processes Syllabus
# Kent State University Department of Geology

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

1. **University Calendar:** The official university calendar, which provides information on deadlines for university-related transactions can be found at: http://www.kent.edu/registrar/calendars/stu_important_fall.cfm

2. **Enrollment Status:** Students are responsible for ensuring that they are properly enrolled in their classes. The official registration deadline for this course is **August 26, 2012** (see the university calendar for late registration deadlines and late fee information, etc.). 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. University policy requires all students to be officially registered in each class they are attending. Students who are not officially registered for a course by published deadlines should not be attending classes and will not receive credit or a grade for the course.

3. **Academic Honor Code:** All students in the course are expected to abide by the academic honor code, as specified in the University's Policy Register. You should work independently unless otherwise directed, such as during group projects. Cheating or the use of other's intellectual property without giving them appropriate credit is a serious academic offense. This includes copying answers or misrepresenting the source, nature or other conditions of your academic work to get undeserved credit. At a minimum, students caught cheating during exams will receive a midterm grade of zero, which will count for 50% of their average midterm score, and the incident will be reported to the university. It is the University's policy that cheating or plagiarism can result in receiving a failing grade for the course or other more serious disciplinary action depending on the nature of the offense. Repeat offenses can result in dismissal from the University. For complete information see the: Kent State University Policy Register, Chap. 3, section 3-01-8

4. **Withdrawal:** For Fall term, the last day to drop a class before a grade of W is applied is **November 4, 2012**. Withdrawal from any or all courses is permitted up to the withdrawal date for the semester, or until the prorated deadline for flexibly scheduled sections. After that time, students are considered to be committed to all remaining courses and must complete them. If students are unable to complete the semester because of extreme circumstances that first occur after the deadline, students should consult their college or campus dean's office. No approval is required to withdraw from a course during the withdrawal period. For more information on withdrawal dates see: http://www.kent.edu/registrar/calendars/stu_important_fall.cfm.

5. **Students with Documented Accommodation needs:** Students who require health-related accommodations to obtain equal access to this course must verify their eligibility through the Office of Student Accessibility Services (SAS) which is located on the ground floor of the DeWeese Health Center (330-672-3391 or http://www.kent.edu/sas). In accordance with University policy, if you have a documented need for a health-related accommodation 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. If you have any questions regarding a potential accommodation need, please contact the instructor and SAS as soon as possible.

6. **Final Exam Date:** Please check the final exam schedule for the classes in which you are enrolled. This can be found on the web at: http://www.kent.edu/registrar/calendars/fall_finalsched.cfm. 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.

**Seminar in Marine Sedimentary Processes**

*This class will consist of three triads.*
*We'll cover the content in each triad as the discussion develops.*

| Week | Dates | Topic | Weekly assignments |
|---|---|---|---|
| | | **Ocean Basins and the Wind Driven Circulation** | |
| *1* | Aug. 29, Aug. 31 | Ocean basins | Ch. 1, 2 |
| *2* | Sept. 5, Sept. 7 | Sediment distribution and transport | Ch. 2 |
| *3* | Sept. 12, Sept. 14 | Properties of sea water | Ch. 3, (except 3.7 and 3.9); **Term project** |
| *4* | Sept. 19, Sept. 21 | The wind driven circulation, 1 | Ch. 7 |
| ***5*** | Sept. 26, **Sept. 28** | The wind driven circulation, 2 | Ch. 7; **Midterm Exam Sept. 28** |
| | | **Density Driven Circulation** | |
| *6* | Oct. 2, Oct. 5 | Distribution of water masses | Ch. 4; **Term Project bibliography** |
| *7* | Oct. 10, Oct. 12 | The thermohaline circulation, 1 | Ch. 5; **Independent reading** |
| *8* | Oct. 17, Oct. 19 | The thermohaline circulation, 2 | Ch. 5 |
| *9* | Oct. 24, Oct. 26 | Global biogeochemical cycles and nutrient distributions | Ch. 14, handouts; **Term Project Outline** |
| ***10*** | Oct. 21, **Nov. 2** | Global biogeochemical cycles and nutrient distributions | Ch. 14, handouts; **Midterm Exam Nov. 2** |
| | | **Oceanic Teleconnections** | |
| *11* | Nov.7, Nov.9 | Arctic Oceanography | Sec. 3.9, Ch. 12; |
| *12* | Nov. 14, Nov.16 | Regional Oceanography: Atlantic, Pacific, Indian and Southern Ocean | Undergraduate assigned reading and in class presentation by groups: Ch. 9, 10, 11, or 13; Grads read all chapters |
| *13* | Nov. 21 ***(Thanksgiving; No class Nov. 25)*** | Arctic Oceanography: Ortiz research | Sec. 3.9, Ch. 12; **Term Project First Draft** |
| *14* | Nov. 28, Nov.30 | Oceans and climate: Implications for various timescales | Ch. S15, handouts |
| *15* | Dec. 5, Dec.7 | Oceans and climate: Implications for various timescales | Ch. S15, handouts; **Term Project Final Version** |
| *16* | Dec. 14 | Cumulative Final Exam | Fri., 10:15 - 12:30 p.m. |

Note: I will be traveling on the dates of Oct 10, 12 to present some of my NSF funded research at an AGU Chapman Conference in South Africa.

Sept 24, 25: Talks by Dr. Mimi Katz, IODP Distinguished Lecturer on the "Evolution of the Antarctic Circumpolar Current", and "Applications of Benthic Foraminifera to Scientific Problems" will count toward class participation. ***Times to be announced.***