

**Welcome to Oceanography
(Geol 21080; Sec 2)
Instructor: Dr. Joseph Ortiz
TR 12:30 – 1:45 pm
McGilvrey 240**

Photos courtesy of NOAA Photo Library. Clockwise from upper left: Jupiter Inlet FL (Marge Beaver, Photography Plus), Point Lobos CA (Capt. A.E. Thereberge, NOAA Corps), Ship Fairweather (Comdr. G. Tuell, NOAA Corps), tuna (D. Cedrone, UNFAO), Beaufort Sea AK (R. Adm. H.D. Nygren, NOAA Corps), tropical reef (M.Al Momany, NOAA), floating berg (M.Van Woert, NOAA NESDIS), coral reef (NOAA).

Course Objectives

Learn principles of geological, chemical, physical and biological oceanography

Emphasize:

- (a) relationships among these systems**
- (b) relationships between the ocean and humans**

Gain a more scientific view of the world

Graphics: (top) Kelp forest, S.Fisher, courtesy of National Marine Sanctuaries, (bottom) *Ogcocephalus parvus*, courtesy of OAR/National Undersea Research Program.

Office Hours and Email

**Dr. Joseph D. Ortiz
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Associate Professor of Geology**

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**Office Hours:
Tues/Thur 10:30 – 11:30 am
Wed. 2:15 – 4:00 pm
(or by appointment)**

Graphic: The TOPEX/POSEIDON satellite altimeter. Image courtesy of NASA Jet Propulsion Lab.

My Web pages

- <http://www.personal.kent.edu/~jortiz>

- <http://www.personal.kent.edu/~jortiz/home/teaching.htm>

Grading

| | |
|-------------------------------------|------------|
| Midterms (3 total, 20% each) | 60% |
| Assignments | 15% |

| | | |
|-------------|-------------------|-------|
| Final Exam | 28% | _____ |
| Total | 100% | |
| | + 3% extra credit | |
| Grand Total | 103% | |

Assignments:

- focus on important concepts that will appear on exams
- may involve working in class in small groups
- may involve take-home work that is due the following class period

Midterm Exams

Midterms: Non-cumulative

| | | |
|----------|--------|-----------------------|
| Exam I | Sep 23 | Intro – Hot Spots |
| Exam II | Oct 19 | Seawater – Greenhouse |
| Exam III | Nov 18 | Hurricanes – Tsunami |

Final Exam (Thursday, Dec. 16 from 12:45- 3:00 pm): Cumulative

~ 60% “recent” material (Challenges – Mammals)

~ 40% major concepts from earlier material

(Intro – Tsunami)

In-class exams are multiple choice

All make-up exams are short answer / essay format

Electronic devices are not permitted during exams

Class Resources

Text: *Garrison, Oceanography: An Invitation to Marine Science, 6th Ed.*

- available online and at the bookstore
- students may use either the hardbound or softbound version

Web site: <http://www.personal.kent.edu/~jortiz/ocean/>

| | |
|--|--------------------------------|
| <i>Schedule, Powerpt Text, Reading</i> | <i>Academic Resources</i> |
| <i>Study Questions</i> | <i>Accommodation Info</i> |
| <i>Study Tips</i> | <i>Careers in Oceanography</i> |
| <i>Grading Policy</i> | <i>Careers in Geology</i> |
| <i>On-line Access to Grades</i> | <i>Just for Fun</i> |
| <i>Announcements</i> | <i>FAQs</i> |

Class Web Site

Class Schedule, Powerpoint Text,

Reading Assignments

Check Your Grades Online

Posted online using Vista

Logon via Flashline with
youruserid@kent.edu

or go to <http://vista8.kent.edu/>

How Important is Attending Class?

Based on data from previous oceanography classes. (Poor attendance is defined as missing 2 or more classes prior to midterm 1)

How To Approach This Course

- Attend lectures, read the text, use web resources

- Use strategies that work with your own learning style
- Focus on understanding concepts
- Ask questions during class or office hours
- Form a study group with your fellow students
- Be courteous during class

Have fun! Oceanography is exciting!

Earth: Ocean Planet

About 70% of Earth's surface is covered by ocean

About 97% of water near the Earth's surface is found in the ocean

Graphic: View of Earth as seen by the Apollo 17 crew traveling toward the moon, Dec. 7, 1972. Photo courtesy of NASA.

What is Science?

A world-view based on observations, experimentation and interpretation

Seeks to uncover natural laws that describe how the universe “works”

Natural Laws are expressed in the physical world as reproducible phenomena

Photo: Dr. J. Ortiz (KSU Dept. of Geology) onboard an oceanographic research vessel.

What is Oceanography?

Scientific study of the ocean, its life forms and bordering lands

Branches:

- Marine Geology
- Chemical Oceanography
- Physical Oceanography
- Biological Oceanography
- Ocean Engineering
- Marine Resource Management

Modern oceanography combines understanding from each of these to address issues of importance to society

Graphic: Soquel Point, CA. Photo courtesy of NOAA. Capt. A.E. Theberge photographer.

Course Themes

- **Building Ocean Basins on a Geologically Active Planet**
- **Oceans and Climate**
- **Ocean Resources and Management**
- **Ocean Biodiversity**

Each theme involves:

- **several branches of oceanography**
- **issues of critical importance to society today**
- **processes occurring at a range of scales, from molecular to global**
- **processes that are also important in other environments (e.g., the Great Lakes, our local watersheds)**

Theme 1: Building Ocean Basins on a Geologically Active Planet

What do oceans have the shapes they do?

How is ocean-building related to other geologic processes?

How does the structure of ocean basins affect the distribution of ocean resources?

Impacts/Importance:

- **Geologic hazards (volcanoes, earthquakes, tsunami)**
- **Navigation and shipping**
- **International relations**

Oceanography in the News

Oceanography in the News

Theme 2: Oceans and Climate

What role do oceans play in regulating climate?

How do oceans contribute to natural climate variability like monsoons and ice ages?

How will oceans affect future climate change?

Impacts/Importance:

- **The global economy (e.g., agriculture, energy production, infrastructure)**
- **Biodiversity**
- **Human health (e.g., cholera, malaria)**

Oceanography in the News

Oceanography in the News

Theme 3: Marine Resources and Management

What resources does the ocean provide?

How can these be managed to ensure future access?

Impacts/Importance:

- **Obtaining energy (oil, gas, wind, biofuels,...)**
- **Ensuring a safe and abundant food supply**
- **Maintaining vital infrastructure, recreation and tourism facilities**

Oceanography in the News

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Oceanography in the News

Oceanography in the News

Theme 4: Oceans and Biodiversity

Why are many marine plants and animals so bizarre?

What makes a healthy marine ecosystem?

How are marine ecosystems changing today?

Impacts/Importance:

- **Overall ecosystem health**
- **Oceans are a tool shed for new inventions and pharmaceuticals**
- **Oceans help us understand our own biology and role in the ecosystem**

Graphics: (top) A healthy coral reef, courtesy of NOAA, (center) sea otter, K.Evans, photographer, courtesy of NOAA National Marine Sanctuaries, (bottom) purple urchin, L.Francis, photographer, courtesy of NOAA National Marine Sanctuaries.

Oceanography in the News Strange but True...

In this class, we'll learn what
a strange place the ocean can
be... and why

We'll also learn why the ocean
is important to all of us

With a group of 2-3 students
sitting near you,

- describe FIVE strange but true things that you already know about the ocean
- list FIVE ways that the Great Lakes (or the Cuyahoga River) are like the ocean

Each group should turn in one sheet with all of your names on it at the end of class
today...I'll share the best during class

Graphic: Courtesy of NOAA and Science.

Preview of Next Lecture

Earthquakes

What are they?

What do they tell us?

Earth's Internal Structure