

270.108 OCEANS AND ATMOSPHERES
Fall 2011
Tuesday and Thursday 1:30-2:45, Olin 305 (Auditorium)

FACULTY

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COURSE DESCRIPTION

This course is a broad survey course of the Earth's oceans and atmosphere, and their role in climate. Topics covered include waves, tides, ocean and atmosphere circulation, weather systems, tornadoes and hurricanes, El Nino, and climate change.

Details of the topics we will cover are in the Schedule below.

This is a Natural Sciences class. There are no pre-requisites for this class. This does not mean that we expect you to know nothing! Instead, it means that you are not *required* to have taken other classes. Taking freshman physics and chemistry is an advantage, however, and a few concepts taught in those classes will be used here without exhaustive explanation. Some students may need to do additional reading to fully grasp all aspects of this class (see below). In terms of intellectual challenge, this class is similar to freshman physics or chemistry.

The class is designed for freshman and sophomore science/engineering students, and non-science majors of all levels. If you do not fit these categories, you should take another class in marine and/or atmospheric science (ask the professors).

Format: The course will be taught as 80min lectures. There will also be review sessions and discussion of graded homeworks. Class materials will be posted to the class Blackboard site.

We will use the CPS "clickers" in this course, available at the bookstore. You should register your clicker for the class via the "CPS Connection" button on Blackboard (see also the instructions in the Handout section of Blackboard).

Any student with a disability who may need accommodations in this class must obtain an accommodation letter from Student Disability Services, 385 Garland, (410) 516-4720, studentdisabilityservices@jhu.edu.

BOOKS

The required text book is:

"Oceans and Atmospheres for JHU 207.108", Cengage Learning [ISBN-10: 1424086604], \$142.85, available at the bookstore (note that the book incorrectly is titled "207.108," not "270.108").

This book contains chapters out of the following two books:

- "Essentials of Oceanography" by T. Garrison, Brooks/Cole Cengage Learning, 5th Ed., 2009 [ISBN-10: 0-495-55531-2, GC11.2.G36 2009 QUARTO].
- "Meteorology Today" by C. D. Ahrens, Brooks/Cole Cengage Learning, 9th Ed., 2008 [ISBN-10: 0495555738, QC861.3.A47 2009 QUARTO].

These books, and earlier editions, are acceptable alternatives to the required text.

These, and the following books, are available at the library:

- "Oceanography: A view of the Earth" by Gross and Gross [GC11.2.G76 QUARTO]
- "Oceanography" by Summerhayes and Thorpe. [QG11.2.O22]
- "Introduction to Ocean Sciences" by Segar. [QG11.2.S443 QUARTO]
- "Essentials of Meteorology" by Anthes. [QC861.3.A39 2008 QUARTO]

- “The Atmosphere” by Lutgens and Tarbuck. [QC861.2.L87]
- “Meteorology: The atmosphere ...” by Moran and Morgan. [QC861.2.M625]

Almost all of the material in “*Oceans and Atmospheres for JHU 207.108*” is also contained in these other books (among others). The class text covers most, but not all the material you will need to learn. In particular, there are some quantitative aspects of the class which are not covered in the book (and the book is not 100% free of errors). As always, the primary source of your information should be your own notes and the fruits of your own initiative. If you have not taken freshman physics or chemistry classes at Hopkins or at high school, you may need to sometimes refer to texts such as: Fundamentals of Physics, 8th Edition, Volume 1, by Halliday, Resnick, and Walker, and Principles of Modern Chemistry by Oxtoby.

ASSESSMENT

There will be two exams – a mid-term and a final – and four homework assignments. Each exam is worth 30% of the final grade and each homework 7.5%. *Attendance will be collected during 13, randomly selected, classes, and attendance at each of these classes will count 1% point towards the final grade, up to a maximum of 10%.* Homeworks handed in late without an acceptable reason will be penalized, or returned un-marked, at the instructors’ discretion. Please inform the instructors *before* the homework deadline if you anticipate a delay in submitting your work.

The policy for homeworks and tests is to set questions with a range of difficulty. Some questions will require quantitative answers and careful thinking about basic (physical, chemical) principles. Some homework questions may require some straightforward research (e.g. online searching). Students very rarely score 100% in homeworks or tests, so you should not expect to either.

The average grade over the last 7 years is a B+, with a third of students earning an A or A- grade. Among the few students who scored a D or worse in the last 7 years, the average attendance in class was 34% and the average rate of submission of homeworks and tests was 50%. So if you don’t want a poor grade, come to class and hand in written work!

In addition, students are expected to read independently on the topics being taught in class. The relevant sections of the course text are indicated in the schedule below.

The professors and teaching assistant are available to answer specific questions on course material, but will not give explicit solutions to homework problems. Please approach us at the end of class or send an email to arrange an appointment. As appropriate, the TA may schedule special question and answer sessions.

Ethics: The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition.

In addition, the specific ethics guidelines for this course are: (1) Homework assignments must be completed without any collaboration with anyone else. All printed and online information source, other than the Garrison and Ahrens texts should be accurately cited. (2) Tests must be completed without any collaboration with anyone else with strict adherence to the rubric of the test.

Report any violations you witness to the instructor. You may consult the associate dean of students and/or the chairman of the Ethics Board beforehand. See the guide on “Academic Ethics for Undergraduates” and the Ethics Board web site (<http://ethics.jhu.edu>) for more information.

SCHEDULE

- 29 Aug, Week 1: Introduction to the planet Earth; Seawater. (*Oceanography Chp. 1, Appendices*)
- 5 Sept, Week 2: Introduction to the planet Earth; Seawater (continued). DROP DEADLINE
- 12 Sept, Week 3: Introduction to the Atmosphere (*Meteorology Chp. 1*)
- 19 Sept, Week 4: Ocean waves (*Oceanography Chp. 3*). (Homework 1: weeks 1–3)
- 26 Sept, Week 5: Ocean tides (*Oceanography Chp. 4*).
- 3 Oct, Week 6: Atmospheric energy balance. (*Meteorology Chp. 2*) (Homework 2: weeks 4–5)
- 10 Oct, Week 7: Atmospheric temperature and pressure. (*Meteorology Chp. 3, 4*. Sample exam)
- 17 Oct, Week 8: Review, **EXAM**
- 24 Oct, Week 9: Global winds. (*Meteorology Chps. 4, 5*)
- 31 Oct, Week 10: Hurricanes. (*Meteorology Chp. 6*)
- 7 Nov, Week 11: Coasts (*Oceanography Chp. 5*) (Homework 3: weeks 7, 9, 10)
- 14 Nov, Week 12: Ocean circulation. (*Oceanography Chp. 2*)
- 21 Nov, Week 13: Ocean circulation (continued) THANKSGIVING
- 28 Nov, Week 14: Climate Change, Review (*Meteorology Chp. 7*) (Homework 4, weeks 11–14. Sample exam)

Homeworks are due on the Tuesday of each week indicated. The mid-term exam will take place on the Thursday indicated, and the final exam will take place at the time assigned by the Registrar during the exam period.