

Syllabus for PHYS 308 (Section 1)
Atmospheric Physics – Fall 2016

Class Times: MWF, 11:00-11:50 AM, JC Long Room 219

Instructor Information: Dr. Mike Larsen

Office Phone: 843-953-2128

Office Hours: Mondays, Wednesdays, and Fridays from 7:15-8:30 AM (at HWWE room 110 – though this time will likely be primarily devoted to helping my PHYS 111 students); Mondays and Wednesdays from 10 AM - 11 AM (in JC Long room 217). Additional times are available by appointment; stop by anytime – but realize that at other times I'm not certain to be in my office or available.

Office Location: JC Long room 217

Email address: LarsenML@cofc.edu (please use sparingly; I'd rather talk to you in person if you have a question or a concern.)

Prerequisites: PHYS 112 or HONS 158 or Permission of Instructor

Course Webpage: http://larsenml.people.cofc.edu/phys308_fall16.html
(Please see course page for full description of course, rationale, and supplementary information).

Textbook: This semester, there is no required text for this course. However, on the course webpage (and as a separate handout given on the first day of class) I have supplied a list of textbooks that may assist you during this course.

Final Exam Time Period: Monday, December 12th, 12-3 pm.

Tentative Midterm Test Dates (Subject to Change):

Friday, September 16th

Friday, October 14th

Friday, November 4th

Friday, December 2nd

Attendance Policy

It is expected that you will attend class. I will. However, attendance is not a part of your course grade. You are responsible for mastering the material presented, recording homework assignments, turning in homework assignments, completing exams, and adjusting your tentative schedule as the semester progresses, and most of these things can only be done if you are attending class. That being said, you are adults and will be treated as such – if you are ready to deal with the repercussions of missing a class (which may include missing important announcements, completing and/or turning in work that drastically impacts your grade, or being exposed to testable material), then attending or not is ultimately your prerogative.

It is extremely difficult to do well if you miss class; we draw content from multiple different sources and there is seldom a great resource to get a complete picture of what you missed. It is highly recommended that you attend every class you possibly can.

Classroom Policies

Please treat your classmates and professor with the respect due to them as fellow adults and human beings. Your professor always reserves the right to dismiss you from the room.

Please do not text message, browse the internet, check email, or engage in other non-class-related communications during class.

Cell phones – Few things irritate your professor as much as having his lecture interrupted by a cell phone ring. It totally makes him lose his train of thought. Please be considerate and turn it on vibrate during lectures. Also, all cell phones must be turned off (NOT JUST TO VIBRATE) during all quizzes and exams. This means you may need to buy a calculator not on your cell phone, because you will not be permitted to use your phone for any purpose during a test. If your professor sees a phone out (or hears one ring) during an exam, it will be assumed that you were using it to cheat.

Honor Code / Code of Conduct / Academic Integrity Statement

It is expected that you will adhere to the university's honor code and student code of conduct, as can be found in your student handbook.

Students with Disabilities

The College will make reasonable accommodations for persons with documented disabilities. Students should apply at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying your professor as soon as possible and subsequently contacting your professor again at least one week before any specific accommodation is needed.

Grading

Grades will be based on three components:

- Performance on midterm exams (12% each) (combines for 48% of the class grade)
- Performance on regularly assigned homework (40%)
- Performance on the comprehensive final examination (12%) (can count for up to 24%; see below)

Your instructor makes every effort to return homework and quizzes as soon as possible after receiving them. Because of this, you will often have graded homework returned (with an answer key) the class after it was due. Since it would be unfair to accept work from students who had the advantage of having the answer key available, late work will be docked at least 10% and up to 50% (at instructor discretion, based on circumstances) if turned in between the original due date and the next class, and will not be accepted for credit more than one class after it was originally due. Your lowest homework grade will be dropped.

*There will be no makeup exams for any reason. If you have a conflict with a scheduled exam, you may work with your professor to try to schedule to take the exam **before** the scheduled exam time/date (but not after).* If you have a known conflict – due to a sporting event, religious observance, interview, or other important event – it is your responsibility to use office hours to discuss options with the instructor *well in advance of the date in question* to try to work out a mutually acceptable solution. (This means approach Dr. Larsen weeks ahead of time, not days or hours).

Homework will be assigned approximately weekly. Please ensure that your solutions are complete, legible, and logically coherent. You may work with your classmates on homework,

but – if you do – make sure (i) you *clearly* indicate on your work who else you worked with. Do this on every problem you collaborated on, and (ii) make sure the work is ultimately your own. I am very tolerant of collaborative work on homework, but I get rather irritated if multiple people make the exact same careless error. By all means, work with other students if you want in developing an approach to a problem – but turn in your own final solution!!! (Incidentally – it is not required to type your homework, but – if you do – it is appreciated.)

Following policy, the final exam is required. There is a little extra wrinkle regarding the final, however; the (comprehensive) final will count for at least 12% of your grade, but may count for up to 24%. I will allow you to replace your lowest midterm exam score with your final exam grade, if your final exam grade is better than your lowest midterm score. Because you have the ability to drop this lowest midterm score, *no makeups for missed exams will be given!!!* The “0” score you record on the missed exam will be replaced by your final exam score. That does mean, however, that your “safety net” is gone; if you do poorly on one of the other midterm exams, unfortunately you will not be able to erase that score.

Grading Scale: The formal numerical scale might move around a little bit depending on the class’ performance, but the final grading scale will be *no more stringent* than:

A	≥ 91	C+	79
A-	90	C	71-78
B+	89	C-	70
B	81-88	D	61-69
B-	80	F	≤ 60

Videorecording

Dr. Larsen is constantly trying to improve his teaching skills. In an effort to aid in instructor evaluation, he may decide to videotape the classes this semester. Dr. Larsen is *not* responsible for making these tapes available for student use, and reserves the right to use the recordings for his purposes. If you have any questions or concerns about this, please visit Dr. Larsen during office hours.

Course Goal

This course seeks to aid students in developing understanding regarding the properties and processes in the Earth's atmosphere.

Learning Objectives

This course endeavors to aid the motivated student in the following tasks:

- Learn about the basic properties and processes in the Earth's atmosphere.
- Understand principles and processes governing the creation, motion, and growth of airborne particles.
- Apply basic Physics principles to the realm of atmospheric microphysics.
- Develop and refine problem solving and critical thinking skills.

Student Learning Outcomes

At the end of this course, successful students will be able to:

- Successfully analyze the thermodynamic and surface properties of water using the laws and principles of thermodynamics.
- Successfully demonstrate an understanding of homogeneous and heterogeneous nucleation of water droplets and ice crystals.
- Successfully analyze and describe the underlying physics regarding the hydrodynamics and equilibrium behavior of cloud and precipitation particles.
- Quantitatively and qualitatively describe basic processes that occur in atmospheric microphysics.
- Draw conclusions based on observations and data.

TENTATIVE Schedule The following is an approximate schedule for the course. All of this (including test dates) is subject to change. (Because I want to make sure to discuss topics that are of interest to you as a class, extensive changes should be expected. You will be given as much notice as possible regarding due date changes – especially for tests. See the course webpage for announcements regarding the schedule.)

Week	Dates	Tent Topics	Materials Due	Due Date
1	8/22-8/26	Basic Atmospheric Literacy	HW1	8/26
2	8/29-9/2	Basic Atmospheric Literacy	HW2	9/2
3	9/5-9/9	Basic Atmospheric Literacy	HW3	9/9
4	9/12-9/16	Basic Atmospheric Literacy	Test 1	9/16
5	9/19-9/23	Aerosols	HW4	9/23
6	9/26-9/30	Aerosol Dynamics	HW5	9/30
7	10/3-10/7	Aerosol Dynamics and Processes	HW6	10/7
8	10/10-10/14	Atmospheric Thermodynamics	Test 2	10/14
9	10/17-10/21	Nucleation	HW7	10/21
10	10/24-10/28	Nucleation and Condensation	HW8	10/28
11	10/31-11/4	Cloud Droplet Growth	Test 3	11/4
12	11/7-11/11	Fall break and Collision/Coalescence	HW9	11/11
13	11/14-11/18	Atmospheric Optics		
14	11/16-11/22	RADAR and Thanksgiving	HW10	11/21
15	11/28-12/2	Atmospheric Electricity	Test 4	12/2
16	12/5	Atmospheric Electricity		
	12/12	EVERYTHING!!!	FINAL	12/12 12-3 PM