Syllabus for PHYS 459 (Section 1)
Cloud and Precipitation Physics – Fall 2019

Class Location / Times: Tuesdays and Thursdays, 12:15 - 1:30 PM, RITA 363

Instructor Information: Dr. Mike Larsen
Office Phone: 843-953-2128
Instructor Email Address: LarsenML@cofc.edu
Office Location: RITA 317
Larsen Research Lab Location: RITA 392

Office Hours: Mondays 4-5 PM, Wednesdays 10-11 AM, Thursdays 8-9 AM, or by appointment.

Prerequisite: PHYS 112 or HONS 158
Prerequisite or Corequisite: MATH 323 or PHYS 272 or permission of the instructor
Course Webpage: http://larsenml.people.cofc.edu/phys459_fall19.html
(Please see course page for full description of course, rationale, and supplementary information).

Official Course Description

> Essential elements of the physics associated with the study of clouds and precipitation.

Attendance Policy

It is expected that you will attend class. I will. You are responsible for any material missed in class, including announcements about homework/test date changes, etc.

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.

Honor Code / Code of Conduct
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: https://tinyurl.com/cofc-handbook.

Textbook and References
The recommended textbook for this course is:
Pruppacher, H.R. and J.D. Klett (2010). *Microphysics of clouds and precipitation* (2nd Ed.) Springer.

Additional information about this text and other texts you may want to use as supplementary sources can be found at `http://larsenml.people.cofc.edu/phys459_texts.pdf`.

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 Phone Policy
Be considerate and turn your phone on vibrate or silent during lectures. Also, all cell phones must be turned off, put away, and remain invisible during all exams. You may be asked to leave your cell phone at the front desk during your midterms and/or final.

Final Exam Time Period:
Saturday, December 7th, 12-3 PM

Tentative Midterm Test Dates (Subject to Change):
Thursday, September 26th
Thursday, November 7th

Campus Closure Statement
If the College of Charleston closes due to inclement weather, students are responsible for taking course materials with them and continuing to work on assigned homework as posted on the course webpage. In cases of extended periods of institution-wide closure where students have relocated, your professor will post a plan for proceeding with course content on the course webpage and/or communicate through your official CofC email accounts.

Grading

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	$\geq$91	B+	89	B-	80	C	71-78	D	60 - 69
A-	90	B	81-88	C+	79	C-	70	F	<60

Your course grade will be based on 3 components:

a) Homework (40% of course grade). Homework will be assigned most weeks. Homework assignments are to be completed clearly and legibly and turned in on time. (Homework will be returned at the start of the next class, so work more than one class late will generally not be accepted; late work turned in prior to the next class will still be accepted, but penalized rather severely).

   You are encouraged to seek help from your instructor, your classmates, and anyone else who can help you with your homework. However, your answers should not be exact copies of a classmate's work. Cooperation is ok, but everyone should turn in their own solutions! At the end of the semester, I will drop the grade from your lowest homework score.

b) Midterm Exams (40% of course grade total, split evenly between 2 exams).

c) Final Exam (20% of course grade).

Since we only have two midterm exams, I will *not* be dropping your lowest exam score in favor of your final exam like I normally do. If you miss a midterm, a make-up exam may be offered *but the makeup exam will be noticeably harder than the original exam.* If you have a known conflict with a scheduled exam, approach your instructor *well in advance of the test* to arrange to take the exam *before* it is scheduled to avoid taking the harder make-up exam..

Specific Course Objectives
Throughout this course, we endeavor 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 conclusion of the course, the successful student will be able to:

- demonstrate an understanding of homogeneous and heterogeneous nucleation of water droplets and ice crystals.
- 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 atmopsheric microphysics.
- draw conclusions based on observations and data.