

ATS 786 – Topics in Cloud Processes
Fall 2021

Course Description:

This class is focused on cloud microphysical and dynamical processes of convective storms. We will discuss the historical evolution of the field, the status of our current understanding of these processes, and the critical, but as yet unanswered, questions underpinning future research.

Course Objectives:

The primary objectives of this course are to:

1. describe the historical evolution of our understanding of cloud microphysical and dynamical processes within deep convective storms;
2. evaluate our current understanding of microphysical and dynamical processes within deep convection;
3. identify critical questions about cloud microphysical and dynamical processes that remain unanswered, and the implications of these shortfalls in knowledge; and
4. discuss the future of the tools necessary to investigate such processes.

Course Outline:

1. Introduction: Our Understanding of Cloud Processes over the Last 100 Years (1 class)
2. Convective Updrafts, Downdrafts and Organization (2 classes)
3. Convective Cold Pools (2 classes)
4. Warm Phase Microphysics (2 classes)
5. Ice Phase Microphysics (2 classes)
6. Aerosol Direct Effects (2 classes)
7. Aerosol Indirect Effects (2 classes)
8. The Future of Numerical Modeling and Satellite Observations (2 classes)

Instructor:

Professor Susan C. van den Heever

Email: Sue.vandenHeever@colostate.edu

Meeting Times:

Thursdays 10:00-10:50.

Classes will be recorded and available on the class website

Prerequisites:

- ATS601, ATS620, ATS640 or ATS641
- PhD students, or MS students with written consent of the instructor

Required Textbooks:

There is no required textbook for this class.

Course notes will be distributed for the class via the website:

<http://vandenheever.atmos.colostate.edu/vdhp/ats786/ats786.php>

Username is 786notes. The password will be distributed in class.

Course Structure, Expectations, and Grading Criteria:

- The class will meet online for one 50-minute period each week.
- The course material will be delivered through instructor lectures and in-class discussions.
- At least 2 hours of effort (2 hours per each hour of class time) outside of class each week are expected to read the notes before class, thereby facilitating class discussions.
- Your attendance and participation in class discussions comprise your grade as shown below.
- There are no exams in this course.

Final Grades:

Your final grade will be weighted as follows:

Class Attendance: 70% Class Participation: 30%

Academic Integrity:

This course will adhere to the CSU Academic Integrity Policy as found in the General Catalog (<https://catalog.colostate.edu/general-catalog/policies/students-responsibilities/>) and the Student Conduct Code (<https://resolutioncenter.colostate.edu/wp-content/uploads/sites/32/2018/08/Student-Conduct-Code-v2018.pdf>). At a minimum, violations will result in a grading penalty and a report to the Office of Conflict Resolution and Student Conduct Services.

Special Needs and Student Disability Center Accommodations

Please see the instructor during the first two weeks of the semester if you have special learning needs that should be accommodated in this class. Students who have federally supported disabilities will find information about supports available at this site:

<https://disabilitycenter.colostate.edu/accommodations-process/>

Basic Needs Statement

At CSU, Rams take care of Rams—period. If you are experiencing food, housing, and/or transportation insecurity, please contact lsc_basicneedsinfo@colostate.edu.

COVID-19 Information

Important information for students: All students are expected and required to report any COVID-19 symptoms to the university immediately, as well as exposures or positive tests from a non-CSU testing location. If you suspect you have symptoms, please fill out the COVID Reporter (<https://covid.colostate.edu/reporter/>). If you know or believe you have been exposed, including living with someone known to be COVID positive, or have symptoms of COVID, it is important for the health of yourself and others that you complete the online COVID Reporter. Do not ask your instructor to report for you. If you do not have internet access to fill out the online COVID-19 Reporter, please call (970) 491-4600. You will not be penalized in any way for reporting. If you report symptoms or a positive test, you will receive immediate instructions on what to do, and CSU's Public Health Office will be notified. Once notified, that office will contact you and most likely conduct contact tracing, initiate any necessary public health requirements and/or recommendations and notify you if you need to take any steps. For the latest information about the University's COVID resources and information, please visit the CSU COVID-19 site:

<https://covid.colostate.edu>.