

INTRODUCTION TO WEATHER AND CLIMATE (ATS 350, 2 hrs)

Instructor: Professor Eric Maloney

Office: 208 Atmospheric Science West (Foothills Campus)

Email: emaloney@atmos.colostate.edu

Office Phone: 970-491-3368

Maloney's Office Hours: Thu, 2-3 pm

Office Hours in Engineering A 102E

Graduate teaching assistants:

Stacey Hitchcock (smhitch@rams.colostate.edu)

Emily Ramnarine (Emily.Ramnarine@colostate.edu)

TA Office Hours: Tu: 12-1 pm, and Wed 1:30-3:30 pm

Text: Meteorology Today, 11th ed., by Donald Ahrens and Robert Henson

Classroom: 120 Engineering, Tu Thu @ 1:00-1:50 pm

Web: Class webpage is available on Canvas.

Contact hours: 2

Student Learning Goals and Objectives: The successful student will gain a broad process-level understanding of meteorology and climate that will enable the student to converse intelligently about current events related to weather extremes and climate change.

Discussion of Course:

This course will survey atmospheric processes with an emphasis on those related to the weather and climate. Lectures will be presented from both descriptive and conceptual viewpoints that will include the physics that drives the described phenomena.

Although this course is not necessarily mathematically rigorous; an equation will occasionally be used to supplement the text.

We will occasionally bring discussion of the current weather into the lectures, particularly as interesting events unfold.

Since the course steadily builds on previous material, it is important to understand what's happening as we proceed. Ask questions when you don't understand something, particularly questions regarding basic concepts. It is *very important* that you read the text, since we can't possibly cover all the material needed for exams during lectures. Reading assignments include all of the chapters referred to in the syllabus (below), and will generally follow this syllabus. Read Chapter 1 as soon as possible. *At least 2 hours of effort are expected to complete readings and homework assignments outside of class for each hour of class time.*

Maloney is available during office hours (or by appointment). The TAs, Stacey Hitchcock and Emily Ramnarine, will hold office hours (above) to address questions encountered during the lecture. However, Stacey and Emily will also be the lead

instructors for ATS 351, *Introduction to Weather and Climate Laboratory*, and so those taking that class will have greater interactions with them then.

Your grade will be derived from points received on three exams during the semester and a final exam. Frequent in-class discussion and other similar participation by students will be rewarded with 'extra credit' up to 1% of the total course grade. There will be no makeup exams or final exams, unless circumstances are *extraordinary*.

Grading: Your grade for this class will be based upon the following:

3 intra-term exams - 25% each

1 final exam - 25%

Lecture Topics (and Chapters):

Week 1: Introduction, structure of the atmosphere, and pressure (Chapter 1)

Week 2: Density, temperature, energy, radiation (Chapters 1,2)

Week 3: Selective absorption, greenhouse effect, globally-averaged energy balance (Chapter 2)

Week 4: Variation of energy balance with latitude, seasons, regional control of temperature (Chapters 2, 3)

Week 5: Water vapor (Chapter 4), **1st Exam**

Week 6: Relative humidity, wet bulb temperature, clouds (Chapters 4 and 5)

Week 7: Stability (Chapter 6)

Week 8: Rain/snow formation, pressure, pressure maps (Chapters 7, 8)

Week 9: Horizontal balance of forces (Chapter 8)

Week 10: Scales of motion, sea breeze, orographic flow, **2nd Exam** (Chapter 9)

Week 11: Monsoons, atmospheric general circulation (Chapters 9, 10)

Week 12: Atmospheric general circulation, ocean general circulation, El Nino (Chapter 10)

Week 13: 3rd Exam, Thunderstorms and Severe Weather (Chapter 14)

FALL BREAK: November 20-24

Week 14: Climate Change (Chapter 18)

Week 15: Climate Change (Chapter 18)

1st Exam, Thursday, September 21.

2nd Exam, Thursday, October 26.

3rd Exam, Tuesday, November 14.

Final Exam, Friday, December 15, 9:40-11:40 a.m.

Statement on Academic Integrity

This course will adhere to the CSU Academic Integrity Policy as found in the General Catalog (<http://catalog.colostate.edu/general-catalog/policies/students-responsibilities/#academic-integrity>) and the Student Conduct Code (<https://resolutioncenter.colostate.edu/conduct-code/>). At a minimum, violations will result in a grading penalty in this course and a report to the Conflict Resolution Services and Student Conduct Services.