ATOC 5050: Introduction to Atmospheric Physics and Dynamics
Fall 2018

Course Goals
This course will provide a quantitative overview of atmospheric thermodynamics and dynamics, supplemented with frequent real-world examples of the phenomena being studied. During the first five weeks of the semester we will consider the thermodynamics of both dry and moist air and the processes that lead to convection in the atmosphere. Next we will consider the forces acting on the atmosphere and derive the equations that govern large-scale atmospheric motions. Scale analysis of these equations will allow us to identify several classes of atmospheric flows. The concepts of circulation and vorticity will then be discussed. The course will conclude with a discussion of the dynamics and thermodynamics of the atmospheric boundary layer.

Contact Information and Office Hours
Professor: Professor John Cassano
Classroom: SEEC S125
Meeting Time: TR 12:00-1:15PM (make-up lectures will be on Tuesdays from 4:00-5:15PM)
Class web site: **http://atoc.colorado.edu/~cassano/atoc5050** (also available as a Canvas web page)
Office: SEEC C279
Office Hours: Wednesday 1:00-2:00PM, Thursday 11:00AM-12:00PM and by appointment
e-mail: john.cassano@colorado.edu

Feel free to contact me if you have any questions or concerns regarding this class. I will have two regularly scheduled office hours per week and you can also contact me by e-mail. If you need to talk to me at a time other than during my regularly scheduled office hours please e-mail to setup an appointment. I am always happy to meet with students at times other than my regularly scheduled office hours.

If you send me an e-mail during the semester you should receive a response from me within 1 to 2 days. If you do not receive a response it is likely that I did not receive your e-mail, so please resend your message or talk with me during class or office hours.

If you discuss any items with me before or after class please follow up with an e-mail to confirm our conversation.

Class web site
The class web site contains a copy of the course syllabus, an electronic version of the lecture notes, a schedule of class lectures, links to images used during lectures, homework assignments and due dates, exam dates, and links to a number of weather web sites. In addition, important class announcements will be posted on the web site, so make sure to check the web site at least once per week for any important information. Access to the class web site is required as all homework assignments and lecture notes will be posted on this web page. Homework and exam answer keys will only be available on the Canvas version of the class web page.

Textbook
The required textbooks for this class are *Atmospheric Science: An Introductory Survey* (2nd edition) by J.M. Wallace and P.V. Hobbs and *An Introduction to Dynamic Meteorology* (5th Edition) by J.R. Holton and G.J. Hakim. Both books are available at the university bookstore.

Course Requirements
Students are expected to read the textbook and to attend the class lectures. The lectures will cover some, but not all of the material in the textbook, and will also present information not contained in the textbook. Exams will be based on information from the textbook, the class lectures, and the homework assignments. An outline of the lecture notes will be posted on the class web site. Students may wish to print these notes prior to a given lecture and use the printed lecture notes as an outline for taking notes during the class. *Reading the online lecture notes is not a substitute for attending the class lectures, since these notes will only serve as an outline for the material presented in class.* During the semester you are encouraged to observe the weather around you, to apply the material learned in class to understanding the weather you observe, and to ask questions based on what you see. Students are expected to both ask and answer questions during the class lectures.

Grading, Exams, and Homework
Your final grade in this course will be made up of:

Two mid-term exams (15% each)
One final exam (20%)
Homework assignments (50%)

The date of all exams and due dates for all homework assignments are listed at the end of this syllabus and on the class web page.

Exams will consist of quantitative problems and short answer questions. No make-up exams will be offered. If you miss a regularly scheduled exam you will receive a grade of zero for that exam. Exam dates can only be rescheduled if they conflict with other official university activities. If you need to miss a regularly scheduled exam it is your responsibility to discuss this with Professor Cassano before the scheduled date of the exam, and you will be expected to take this exam before the regularly scheduled exam date.

Homework assignments will consist of multiple problems primarily from the class textbooks, and are due by the end of class on the dates listed on the class schedule. **No late homework assignments will be accepted** so that I can post the answer key immediately after the homework is due. This will give students the maximum time to study these prior to exams.

Honor Code
All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code (honor@colorado.edu); 303-492-5550). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the Honor Code Office website.

In addition to the honor code violations listed above and on the Honor Code web pages **students enrolled in this course are not permitted to use homework, exams, or other course materials from previously taught sections of ATOC 5050**. Students found using these materials will face standard honor code violation procedures.

All students caught violating the honor code in this class will receive a final class grade of F. Cheating and academic dishonesty will not be tolerated in this class.

Accommodation for Disabilities
If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the Disability Services website. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition or injury, see Temporary Medical Conditions under the Students tab on the Disability Services website.

Religious Holidays
Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, please contact Professor Cassano two weeks before any conflicts to arrange for appropriate accommodations.

See the campus policy regarding religious observances for full details.

Classroom Behavior
Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. For more information, see the policies on classroom behavior and the Student Code of Conduct.

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation
The University of Colorado Boulder (CU Boulder) is committed to fostering a positive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (including sexual assault, exploitation, harassment, dating or domestic violence, and stalking), discrimination, and harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or cureport@colorado.edu. Information about the OIEC, university policies, anonymous reporting, and the campus resources can be found on the OIEC website.

Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

How to succeed in this class
- Read the appropriate sections of the textbook and online lecture notes before each lecture
- Attend all lectures and ask and answer questions during classes
- Check the class web page at least once per week for updates and class news
- Complete all homework on time and in a neat manner (if I can't read your answer it will be marked as incorrect).
- Show all necessary work on your homework assignments and exams – partial credit will be awarded as appropriate.
- Do not miss exams
- Ask for help if you don't understand something
- Contact Professor Cassano as soon as possible if you have any questions or concerns about this class

Lecture, Homework, and Exam Schedule
The following is a tentative schedule of class lectures, due dates for homework assignments, and exam dates. Any changes to this schedule will be posted on the class web site under the *Class News* link.

Tuesday	Thursday
28 Aug WH Ch 1	**30 Aug** WH Ch 1
4 Sept WH Ch 3-1	**6 Sept** WH Ch 3-1
11 Sept WH Ch 3-2 Make-up lecture: WH Ch 3-2	**13 Sept: HW1 due** WH Ch 3-2
18 Sept WH Ch 3-3	**20 Sept** WH Ch 3-3
25 Sept: HW 2 due WH Ch 3-4 / Math methods Make-up lecture: HH Ch 1	**27 Sept** HH Ch 1
2 Oct: HW 3 due HH Ch 1 Make-up lecture: HH Ch 1 / HH Ch 2	**4 Oct** Review / HH Ch 2
9 Oct **Exam 1**	**11 Oct: No Lecture** Make-up lecture 11 Sept
16 Oct: No Lecture Make-up lecture: 25 Sept	**18 Oct: No Lecture** Make-up lecture: 2 Oct
23 Oct: HW4 due HH Ch 2	**25 Oct** HH Ch 2 / HH Ch 3
30 Oct HH Ch 3	**1 Nov: HW 5 due** HH Ch 3
6 Nov HH Ch 3 / Review	**8 Nov** **Exam 2**
13 Nov HH Ch 3	**15 Nov: HW 6 due** HH Ch 4
20 Nov No Class	**22 Nov** No Class
27 Nov HH Ch 4	**29 Nov** HH Ch 4 / WH Ch 9
4 Dec HH Ch 8 / WH Ch 9	**6 Dec** HH Ch 8 / WH Ch 9
11 Dec: HW7 due HH Ch 8 / WH Ch 9	**13 Dec** Review

Lecture: Tuesday / Thursday 12:00 to 1:15PM, SEEC S125
Make-up lectures: Tuesday 4:00-5:15PM, Room TBD

WH: Wallace and Hobbs, *Atmospheric Science: An Introductory Survey*
HH: Holton and Hakim, *An Introduction to Dynamic Meteorology*

Exam 1: WH Ch 1, WH Ch 3-1, WH Ch 3-2, WH Ch 3-3, WH Ch 3-4
Exam 2: HH Ch 1, HH Ch 2
Final Exam: Comprehensive with emphasis on HH Ch 3, HH Ch 4, HH Ch 8, WH Ch 9

Final exam: TBD but likely Wednesday 19 Dec 4:30-7:00PM

Updated: 6 August 2018