ATMS 251 Mathematics in Meteorology Lab

Spring 2020

What is all about this course?

A lab to study the basics of mathematics, equations and theories used in meteorology. It is to help students to learn mathematical representations of fundamental meteorological equations and how those equations can be applied using operational meteorological data. This 1-credit lab course fulfills part of course requirements for meteorology majors. Prerequisites: ATMS 103 or 113; MATH 191.

Who is the instructor?

Dr. Huo-Jin (Alex) Huang, RRO 236B
232-5157 (O)
Dept. of Atmospheric Sciences, UNCA
e-mail: ahuang@unca.edu
http://blizzard.atms.unca.edu/ahuang

What is the structure of the course?

- Lab lectures
- 13 (or 14) Lab assignments
- Course materials on Moodle
- **Check out Moodle Daily**

When and Where do we meet?

3:30 – 6:00 pm, Monday, RRO 238

Office Hours:

Monday 2:30—3:30 pm;
Tuesday, Thursday 11:10 am —12:00 pm.
(or by appointment, but walk-in is always welcome)

How will you be graded?

- 14 Lab Assignments: 60%;
- Classroom participation: 5%;
- Comprehensive in-class Open-book Final Exam: 35%.

Textbook:

Mathematics in Meteorology Lab Handout (2020) by Alex Huang.

Grade Scale (100%)

A ≥ 93: A-: 92.5-90;
B+: 89.5-87; B: 86.5-83; B-: 82.5-80;
C+: 79.5-77; C: 76.5-73; C-: 72.5-70;
D+: 69.5-67; D: 66.5-60; F: ≤ 59.5.

How can you succeed in this course?

- Come to Classes
- Do your Assignments
- Read materials
- Ask Instructor
- Ask questions
- Form study group
- Think, review, connect
- Be healthy
- Choose right friends
- Check out Moodle daily!

Exam Dates:

Final Exam: 3:00 – 5:30 pm, Friday, 5/1/2020.

How can you contact the instructor? By e-mail to **ahuang@unca.edu**

ATMS 251 COURSE OUTLINE

Week	Dates	Subject	EX
1	1/13	Equation of State (Ideal Gas Law)	1
2	1/20	Martin Luther King, Jr holiday. No classes.	
3	1/27	Decomposition of Wind	2
4	2/3	Temperature Tendency and Gradient	3
5	2/10	Pressure Tendency and Gradient	4
6	2/17	Continuity Equation (Conservation of Mass)	5
7	2/24	First Law of Thermodynamics (Conservation of Energy)	6
8	3/2	Moisture Variables and Clausius-Clapeyron Equation	7
9	3/7-3/15	Spring Break	
10	3/16	Moisture Equation (Conservation of Moisture)	8
11	3/23	Lapse Rates and Potential Temperature	9
12	3/30	Equations of Motion (Conservation of Momentum)	10
13	4/6	Balanced Winds	11
14	4/13	Hydrostatic Balance and Hypsometric Equation	12
15	4/20	Thermal Wind and Thermal Advection	13
16	4/27	Vorticity, Divergence, and Vorticity Advection	14
16	5/1	In-Class Open-book FINAL EXAM, Friday, 3:00 – 5:30 pm.	

Disclaimer: This syllabus is the contract between the instructor and students. Most information will not be changed. However, the schedule may be altered due to unforeseeable circumstances upon the agreement between the instructor and students.

Student Learning Outcomes: Upon completing this course successfully, you should be able to:

- Identify and understand weather variables;
- Apply mathematics to explain meanings of meteorological equations;
- Understand the mathematical representation of weather processes; and
- Connect the meteorological equations to the daily weather.

Special Remarks: Class attendance is strongly recommended. You are solely responsible for the consequences due to your absence. No make-up quizzes/tests will be given. An exception may be granted for uncontrollable circumstances and medical reasons. You have to consult with the instructor at your earliest convenience for exceptions. A **significant** reduction of your score on your late assignments and make-up quizzes/tests may be applied. You will receive an F for the semester if you miss more than **3** class periods without any justifiable and excusable reasons. No operational electronic devices are allowed during the class period unless you are permitted to use them.

Academic Integrity: Individual honesty and responsibility are expected, and academic integrity is enforced. Any act of plagiarism or cheating is academic dishonesty. A person who knowingly assists another in cheating is likewise guilty of cheating. According to the instructor's view of the gravity of the offense, a student may be punished by a failing grade or a grade of zero for the assignment or test, or a failing grade in the course. If it seems warranted, the instructor may also recommend to the Provost dismissal or other serious university sanction. Please review the procedures outlined in Section 8.3 of the UNCA Faculty Handbook (http://www3.unca.edu/aa/handbook/8.htm) that relate to academic dishonesty.

Office of Academic Accessibility

UNC-Asheville values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources.

Students who experience a barrier to full access to this class should let the professor know, and/or make an appointment to meet with the Office of Academic Accessibility as soon as possible. To make an appointment, call 828.232.5050; email academicaccess@unca.edu; use this link https://uncaoaaintake.youcanbook.me/; or drop by the Academic Accessibility Office, room 005 in the One Stop suite (lower level of Ramsey Library). Learn more about the process of registering, and the services available through the Office of Academic Accessibility here: https://oaa.unca.edu/

While students may disclose disability at any point in the semester, students who receive Letters of Accommodation are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester. timely manner. It is the student's responsibility to follow this process each semester.

Sexual Harassment and Misconduct

All members of the University community are expected to engage in conduct that contributes to the culture of integrity and honor upon which the University of North Carolina at Asheville is grounded. Acts of sexual misconduct, sexual harassment, dating violence, domestic violence and stalking jeopardize the health and welfare of our campus community and the larger community as a whole and will not be tolerated. The University has established procedures for preventing and investigating allegations of sexual misconduct, sexual harassment, dating violence, domestic violence and stalking that are compliant with Title IX federal regulations. To learn more about these procedures or to report an incident of sexual misconduct, go to titleix.unca.edu. Students may also report incidents to an instructor, faculty or staff member, who are required by law to notify the Title IX Office.

Understanding Academic Alerts

Faculty at UNCA are encouraged to use the university's Academic Alert system to communicate with students about their progress in courses. Academic Alerts can reflect that a student's performance is satisfactory at the time the alert is submitted, or they can indicate concerns (e.g., academic difficulty, attendance problems, or other concerns). Professors use the alert system because they are invested in student success and want to encourage open conversations about how students can improve their learning, and students who respond to alerts quickly are consistently more likely to earn credit for the course. Please note, professors of 100-level courses are required to submit at least one alert about each student on or before the seventh week of classes.

When a faculty member submits an alert that expresses a concern, the student receives an email from Academic Advising notifying them of the alert and subsequent registration hold on their account. To clear the hold, the student must complete a short Google Response Form included in the alert e-mail; the results will be shared with their instructor and advising staff. Instructors may also request to meet with the student to discuss the alert.

Questions about the Academic Alert system can be directed to Anne Marie Roberts (amrober1@unca.edu) in OneStop Advising and Learning Support.

Writing Center

The University Writing Center (UWC) supports writers in one-on-one sessions lasting 10 to 45 minutes. Consultants can help writers organize ideas, document sources, and revise prose. If you visit the UWC, bring a copy of your assignment, any writing or notes you may have, and the sources you are working with. Make an appointment by visiting writingcenter.unca.edu and clicking on "Schedule an Appointment," or drop in during open hours Monday-Friday.