METR 4320 / ESCI 5320
TROPICAL METEOROLOGY
FALL 2021

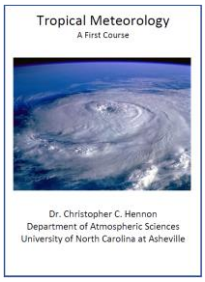
Instructor: Dr. Matthew Eastin
mdeastin@uncc.edu

Class Time: Monday / Wednesday at 4:00 – 5:15 pm
Class Location: McEniry 118

Office: Cedar 35A / McEniry 209
Office Hours: Monday / Wednesday 10–11 am and 1–2 pm

Teaching Assistant: None

Text (Required): **Tropical Meteorology: A First Course**
Christopher C. Hennon
[Beta Version - Chapters provided on Canvas]



Course Description: This course provides a comprehensive study of the tropical atmosphere, including climatology, mean structure and circulation, air-sea energy exchange, cumulus transport, synoptic waves, and tropical storms. Special attention is paid to the formation, evolution, motion, and societal impacts of hurricanes.

Course Student Learning Objectives (SLOs):

1. Discuss regional variability in tropical cyclone activity.
2. Forecast tropical cyclone evolution based on environmental parameters.
3. Explain the societal impacts produced by tropical cyclones.
4. Discuss how intraseasonal-interannual tropical variability can modulate regional weather.
5. Prepare a concise and informative tropical weather briefing on current events.

Programmatic Student Learning Objectives (SLOs):

1. Develop sufficient knowledge to describe, analyze, and forecast the three-dimensional structure, evolution, and dynamics of the atmosphere. (Meteorology – SLO1)
2. Demonstrate the ability to understand the climate system and apply this knowledge to improve human systems. (Meteorology – SLO2)
3. Practice oral communication skills to a degree whereby one can effectively communicate a scientific topic to the public. (Meteorology – SLO3)

Course Policies:

Face Masks: In accordance with university policy, all students and faculty are required to wear a mask over their nose and mouth while indoors. Therefore, all students are required to wear a mask throughout all in-person class periods. No masks are required during virtual/online classes.

Attendance and Participation: Attendance is essential to maintaining an effective learning environment. Regular class attendance and active participation is expected. During any virtual classes, active participation requires your virtual classroom camera to be "on" throughout the period**. Use of smart phones, email, texting, or music players during class is strictly prohibited.**

Course Etiquette: Open and mutually respectful communication of varied opinions, beliefs, and perspectives during classroom or online discussion encourages the free exchange of ideas that is essential to higher learning and to the ability to learn from each other. Students are expected to display tolerance for others' views in the course. They are also to refrain from the use of any inappropriate language anywhere within the course.

Unwelcome conduct directed toward another person based upon that person's actual or perceived race, actual or perceived gender, color, religion, age, national origin, ethnicity, disability, or veteran status, or for any other reason, may constitute a violation of University Policy 406, The Code of Student Responsibility. Any student suspected of engaging in such conduct will be referred to the Office of Student Conduct.

Assignment Deadlines and Extra Credit: **I expect you to turn in assignments as scheduled** except due to extraordinary circumstances or participation in a college sanctioned event. I will not accept late assignments. There will be **no *individual* extra credit**.

Exams: All examinations will be administered either in the classroom or online. **All exams will occur as scheduled.** If you miss an exam for what you believe to be a valid reason, you must provide documentation for me to consider allowing a make-up. You are expected to adhere to the following procedures while taking online exams:

- You are to take the test by yourself; no group effort or help from outside people.
- You may NOT use your book and/or notes (unless explicitly directed to do so).
- You will have the full class period to complete each exam.
- You must remain seated in front of your virtual classroom camera during the exam.
- Your virtual classroom camera must remain ON throughout the exam.
- If your computer freezes, get back into the test as quickly as you can. As soon as you complete the test, send me an email detailing your problem.
- If you lose your ability to access the Internet during an exam, email me immediately when you have service, do not wait!

Academic Integrity: Students are responsible for knowing and following the UNCC Code of Student Academic Integrity http://www.legal.uncc.edu/policies/ps-105.html and the UNCC Code of Student Responsibility https://legal.uncc.edu/policies/up-406 in all aspects of their work in this course. This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism, abuse of academic materials, and complicity of academic dishonesty. Standards of academic integrity will be enforced in this course.

Accommodations: Students seeking disability accommodations must first consult with the Office of Disability Services and follow the instructions of that office for obtaining accommodations.

Copyright: My lectures and course materials, including videos, presentations, homework assignments, exams, outlines, and similar materials, are protected by copyright. I am the exclusive owner of copyright in those materials I create. I encourage you to take notes and make copies of course materials for your own educational use. However, you may not, nor may you knowingly allow others to reproduce or distribute lecture notes and course materials publicly without my express written consent. This includes providing materials to commercial course material suppliers or other similar services. Students who publicly distribute or display or help others publicly distribute or display copies or modified copies of an instructor's course materials may be in violation of University Policy 406, The Code of Student Responsibility.

Course Requirements:

Class Participation (all students): Each student is required to attend class and actively participate (take notes, ask questions, and complete in-class activities) throughout the period. During any virtual classes, your virtual classroom camera must remain ON throughout the class period. **Use of cell/smart phones, email, texting, and/or music players during class is strictly prohibited.**

Weather Briefings (all students): Each student will be required to lead one weather briefing during the semester. Briefings will occur at the end of class and last no longer than 15 minutes. Briefings should focus on events in the **tropical Atlantic**. *Students not leading the briefing are expected to participate by asking questions and/or providing alternative interpretations.* A list of topics that should be covered during each briefing and the evaluation rubric are available on the course website. I will do the briefings for the first three weeks.

Homework (all students): A total of six homework assignments will be given. Each homework will consist of in-depth exercises related to recent topics and will involve the examination of cases study data from a variety of observing platforms and numerical models. You are required to show and/or explain your work on all homework assignments. **Access to a color printer is required.**

Paper Presentation (ESCI 5320 students only): Each graduate student will read and orally present a professional journal article on a tropical phenomenon. Oral presentations (18-20 minutes in length) should include a summary of the article's methods and results, as well as a critique of the data, methods, and/or results. The article may be chosen from the provided list or selected independently. All articles must be approved by the instructor. A list of potential articles and the evaluation rubric are available on the course website.

Exams (all students): All exams will be during class (either in-class or online) and will be closed book. There will be two exams during the semester (on **October 4** and **November 3**) and a cumulative final exam (**December 15, 5:00-7:30 pm**). The final exam day/time ***may not*** be rescheduled; plan your semester end to accommodate the university-designated final exam time (see http://registrar.uncc.edu/calendar-and-exam-schedules/exam-schedules).

Evaluation:

The grading scale will be a standard percentile scale. Your final grade will be calculated using the following point distribution.

	METR 4320	ESCI 5320
Class Participation	25	25
Weather Briefing	25	25
Homework (6 @ 25 pts. each)	150	150
Paper Presentation	---	50
Exam-1	50	50
Exam-2	50	50
Cumulative Final Exam	100	100
Total Points	400	450

Percent	Grade
90-100	A
80-89	B
70-79	C
60-69	D
0-59	F

Tentative Class Schedule:

Week	Date		Subject	Reading (Text)
1	Mon	8/23	Introduction to the Course and Observing the Tropics	Chapters 1 + 6
	Wed	8/25	Tropical Cyclone Climatology	Chapter 7
2	Mon	8/30	Tropical Cyclone Climatology	
	Wed	9/01	Introduction to Cylindrical Coordinates	
3	Mon	9/06	**No Class – Labor Day**	
	Wed	9/08	Tropical Cyclone Structure and Evolution	
4	Mon	9/13	Tropical Cyclone Structure and Evolution	Chapters 8 + 10
	Wed	9/15	Tropical Cyclone Structure and Evolution	
5	Mon	9/20	Tropical Cyclone Structure and Evolution	
	Wed	9/22	Tropical Cyclone Structure and Evolution	
6	Mon	9/27	Tropical Cyclone Structure and Evolution	
	Wed	9/29	Tropical Cyclone Structure and Evolution	
7	Mon	10/04	**Exam #1**	
	Wed	10/06	Tropical Cyclone Motion	Chapter 9
8	Mon	10/11	**No Class – Fall Break**	
	Wed	10/13	Tropical Cyclone Forecasting	Chapter 11
9	Mon	10/18	Tropical Cyclone Forecasting	
	Wed	10/20	Societal Impacts of Tropical Cyclones	Chapter 12
10	Mon	10/25	Societal Impacts of Tropical Cyclones	
	Wed	10/27	Climatology and Large-Scale Circulations in the Tropics	Chapters 2 + 3
11	Mon	11/01	Climatology and Large-Scale Circulations in the Tropics	
	Wed	11/03	**Exam #2**	
12	Mon	11/08	Convective Processes in the Tropics	
	Wed	11/10	Tropical Waves	Chapter 4
13	Mon	11/15	Atmosphere-Ocean Coupling and ENSO	Chapter 13
	Wed	11/17	Atmosphere-Ocean Coupling and ENSO	
14	Mon	11/22	**No Class – Professional Travel**	
	Wed	11/24	**No Class – Thanksgiving Break**	
15	Mon	11/29	Intraseasonal and Interannual Variability	Chapters 5 + 14
	Wed	12/01	Intraseasonal and Interannual Variability	
16	Mon	12/06	Monsoons	
	Wed	12/08	**Paper Presentations by Graduate Students**	
			Course Review and Evaluation	
17	Wed	12/15	**Cumulative Final Exam: 5:00 – 7:30 pm**	