METR 4320 / ESCI 5320
TROPICAL METEOROLOGY
FALL 2025

Instructor: Dr. Matthew Eastin
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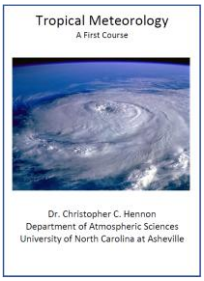
Class Time: Monday / Wednesday at 4:00 – 5:15 pm
Class Location: McEniry 118

Office: 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 its climatology, structure, circulation, air-sea energy exchange, cumulus transport, synoptic waves, and severe 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:

Attendance and Participation: Attendance is essential to maintaining an effective learning environment. Regular class attendance and participation are expected. Attendance will be taken twice each class – five minutes after the start of class (at 4:05 pm) and five minutes before the end of class (at 5:10 pm). You must be present both times to earn attendance credit for any given class day. **The use of smart phones, email, messaging, headphones, earbuds, or any form of social media during class is strictly prohibited.**

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 in the classroom on the scheduled date unless you have formal accommodation through the Office of Disability Services. If you miss an exam for what you believe to be a valid reason, you must provide written documentation (supporting the reason for your absence) before any consideration of a make-up exam is made.

Accommodation: Students seeking disability accommodation must first consult the Office of Disability Services and follow the instructions provided by that office for obtaining accommodation.

Academic Integrity: Students are responsible for knowing and following the UNCC Code of Student Academic Integrity https://legal.charlotte.edu/policies/up-407 and the UNCC Code of Student Responsibility https://legal.charlotte.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 the course.

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 and refrain from the use of any inappropriate language. Unwelcome conduct directed toward another person based upon that person's actual or perceived race, 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.

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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. Attendance will be taken twice during each class – five minutes after the start of class (at 4:05 pm) and five minutes before the end of class (at 5:10 pm). You must be present at both times to earn attendance credit on any given class day. **Use of smart phones, email, messaging, headphones, earbuds, or any form of social media (including its use on tablets and laptops) during class is strictly prohibited**. Any student observed using such media during class (either during lecture or in-class activities) will lose all attendance points for that day.

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**. A list of topics that should be covered during each briefing and the evaluation rubric are available on Canvas. I will do the briefings for the first three weeks.

Homework (all students): A total of **six homework assignments** will be given. Each assignment will consist of in-depth exercises related to recent topics and/or historical case data from a variety of observing platforms and numerical models. In several assignments you will be mimicking forecasting activities routinely performed at the National Hurricane Center and/or local NWS forecast Offices. You are required to show and/or explain your work on all assignments. **Access to a color printer or the ability to modify/save (i.e., draw on) an image or PDF file is required.**

Reading Quizzes (all students): A total of ***six reading quizzes*** will be given. Each quiz will cover content from the assigned reading (see semester schedule below) that students are expected to complete ***before*** the material is covered in lecture. Hence, reading the assigned textbook sections ahead of time will be critical to passing the quizzes. Quizzes will be given during the first 10 minutes of a class. Your overall quiz grade will be based on your ***highest five scores***; the lowest score will be dropped. There will be ***no make-up quizzes for any reason***.

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 list provided or selected independently. All articles must be approved by the instructor. A list of potential articles and the evaluation rubric are available on Canvas.

Exams (all students): All exams will be closed note / book during class. There will be two exams during the semester (on **October 1** and **November 12**) and a final exam (on **December 10**). The final exam day/time ***may not*** be rescheduled; plan your semester end to accommodate the university-designated final exam date/time (see https://ninercentral.charlotte.edu/courses-registration/registration-resources/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 @ 20 pts. each)	120	120
Reading Quizzes (5 @ 6 pts each)	30	30
Paper Presentation	---	50
Exam-1	50	50
Exam-2	50	50
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

Note: The **maximum total extra credit** that you can earn in the course is **20 points** (~5% of your overall grade). Each seminar summary is worth a maximum of 4 points (based on the length and depth of your summary). Additional extra credit opportunities may be offered throughout the semester.

Tentative Class Schedule:

Week	Date		Subject	Reading (Text)	Quizzes
1	Mon	8/18	Introduction and Observing the Tropics	Chapters 1 + 6	
	Wed	8/20	Tropical Cyclone Climatology	Chapter 7	**Quiz-1**
2	Mon	8/25	Tropical Cyclone Climatology		
	Wed	8/27	Tropical Cyclone Structure and Evolution		
3	Mon	9/01	**No Class – Labor Day**		
	Wed	9/03	Tropical Cyclone Structure and Evolution	Chapter 8	**Quiz-2**
4	Mon	9/08	Tropical Cyclone Structure and Evolution		
	Wed	9/10	Tropical Cyclone Structure and Evolution		
5	Mon	9/15	Tropical Cyclone Structure and Evolution	Chapter 10	**Quiz-3**
	Wed	9/17	Tropical Cyclone Structure and Evolution		
6	Mon	9/22	Tropical Cyclone Structure and Evolution		
	Wed	9/24	Tropical Cyclone Structure and Evolution		
7	Mon	9/29	Tropical Cyclone Structure and Evolution		
	Wed	10/01	**Exam #1**		
8	Mon	10/06	Tropical Cyclone Motion	Chapter 9	
	Wed	10/08	Tropical Cyclone Forecasting	Chapter 11	**Quiz-4**
9	Mon	10/13	**No Class – Professional Travel**		
	Wed	10/15	**No Class – Professional Travel**		
10	Mon	10/20	Tropical Cyclone Forecasting		
	Wed	10/22	Societal Impacts of Tropical Cyclones	Chapter 12	
11	Mon	10/27	Societal Impacts of Tropical Cyclones		
	Wed	10/29	Societal Impacts of Tropical Cyclones		
12	Mon	11/03	Societal Impacts of Tropical Cyclones		
	Wed	11/05	Climatology & Large-Scale Tropical Circulations	Chapters 2 + 3	**Quiz-5**
13	Mon	11/10	Climatology & Large-Scale Tropical Circulations		
	Wed	11/12	**Exam #2**		
14	Mon	11/17	Synoptic-Scale Tropical Waves	Chapter 4	
	Wed	11/19	El Nino – Southern Oscillation (ENSO)	Chapter 13	**Quiz-6**
15	Mon	11/24	El Nino – Southern Oscillation (ENSO)		
	Wed	11/26	**No Class – Thanksgiving Break**		
16	Mon	12/01	**Graduate Student Presentations**		
			Course Review		
	Wed	12/03	**No Class – Reading Day**		
17	Wed	12/10	**Final Exam: 5:00 – 7:30 pm**		