

MET3502 / MET5561: Synoptic Meteorology & Midlatitude Synoptic Meteorology

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- Office Hours: By Appointment through email
- Website: [Faculty Website](#)
- Turn Around: Within 24 - 48 hours

Course Time Zone | Eastern Time (ET). Course due dates are according to this time zone.

General Information

Course Description and Purpose

This course focuses on analysis and forecasting of middle-latitude weather systems. We will examine the structure and dynamics of these systems by integrating weather observations with the current state of dynamic theory, numerical weather prediction models, and the physical principles of atmospheric thermodynamics and cloud and precipitation physics. Graduate students will have the opportunity to work on a research-related literature review and term paper report to increase their ability to utilize knowledge learned in their research/thesis work. **This course includes 7 modules with 20 lectures as your learning materials. There will be 8 assignments as assessments for all students. For graduate students, there will be a term paper due by the end of the semester.**

Course Objectives

Upon completing this course, students will be able to:

- CLO1: Describe the scope of synoptic meteorology
- CLO2: Apply various tools into weather analysis and prediction
- CLO3: Interpret weather maps and apply them to real cases
- CLO4: Interpret basic equations governing synoptic-scale motions
- CLO5: Apply dynamic and thermodynamic theories of midlatitude weather systems into real-world weather analysis

Important Information

Policies

Before starting this course, please review the following pages:

- [Policies](#)
- [Netiquette](#)
- [Technical Requirements and Skills](#)
- [Accessibility and Accommodation](#)
- [Panthers Care & Counseling and Psychological Services \(CAPS\)](#)
- [Academic Misconduct Statement](#)
- [Copyright Statement](#)
- [Inclusivity Statement](#)

Course Prerequisites

This course has a prerequisite(s). Review the [Course Catalog](#) webpage for prerequisites information.

Prerequisite: MET3003, General Meteorology or instructor's permission.

Textbook and Course Materials

- **Mid-Latitude Atmospheric Dynamics - A First Course (Optional)**
- Publisher: Wiley, Edition: 1st, Year: 2006
- ISBN: 978-0-470-86465-4
- You may purchase your textbook online at the [FIU Bookstore](#).

Recommended Supplemental Textbook:

An Introduction to Dynamic Meteorology, Third Edition by James Holton, Academic Press, 1992, ISBN 0-12-354355-X.

Expectations of this Course

This is an online course, which means most (if not all) of the course work will be conducted online. Expectations for performance in an online course are the same as a traditional course. In fact, online courses require a degree of self-motivation, self-discipline, and technology skills which can make these courses more demanding for some students.

Students are expected to:

- **review the getting started page** located in the course modules;
- **introduce yourself to the class** during the first week by posting a self-introduction in the appropriate discussion;
- **take the practice quiz** to ensure that your computer is compatible with the learning management system, Canvas;
- **interact** online with instructor and peers;
- **review** and follow the course calendar and weekly outlines;
- **log in** to the course **2 times** per week;
- **respond** to discussions by the due date specified. **No late work will be accepted;**
- **respond to emails** within **1-2 days;**
- **submit** assignments by the corresponding deadline.

The instructor will:

- log in to the course **once** week;
- respond to **emails** within **24-48 hours;**
- grade assignments within **7-14 days** of the assignment deadline.

Course Detail

Course Communication

Communication in this course will take place via the Canvas Inbox. Check out the [Canvas Conversations Tutorial](#) or [Canvas Guide](#) to learn how to communicate with your instructor and peers using Announcements, Discussions, and the Inbox. I will respond to all correspondences **via email not the Canvas inbox** within **24 - 48 hours**.

Discussion Forums

Keep in mind that your discussion forum postings will likely be seen by other members of the course. Care should be taken when determining what to post.

Besides the default & optional “introduce yourself” discussion at the beginning of the semester, one discussion assignment will be given in the first module. This graded and peer-reviewed

assignment gives you the opportunity to introduce your academic background and describe your favorite weather system.

Quizzes

In order to mitigate any issues with your computer and online assessments, it is very important that you take the [Practice Quiz](#) from each computer you will be using to take your graded quizzes and exams. Assessments in this course are not compatible with mobile devices and should not be taken through a mobile phone or a tablet.

There will be 7 quizzes, one for each module. Students will be able to see the results (total score only) and grades immediately after each quiz. Students can have multiple attempts for all quizzes; only the highest score before the deadline will be taken. Additionally, there will be one student feedback survey quiz given during module 3.

Assignments (Graduate Students Only)

Graduate Student Term Paper Assignment

Graduate students are required to do a literature review on a research topic of your choice (better related to your research/thesis/dissertation project). You are required to write a term paper report of 5-10 pages on the literature review. You don't have to include any results of yourself (You absolutely can if you do). Instead, you should just write a background review of this topic. You should read about 5-10 reference papers in this topic, and read them carefully and summarize their research methods & findings. Your paper should be 5-10 pages long (single-spaced, font size 12). Rubric for evaluation will be posted on Canvas.

Zoom Video Conference

Zoom is a video conference tool that you can use to interact with your professor and fellow students by sharing screens, chatting, broadcasting live video/audio, and taking part in other interactive online activities.

Zoom meetings can be accessed via the Zoom link in the course navigation menu. Once you click on the Zoom link, it will route you to join the meeting for the respective class session. You will also be able to view upcoming meetings, previous meetings that you have already joined, and meeting recordings. Before joining an actual class session:

- Reference the [Zoom Student Tutorials](#) to learn about the tool, how to access your meeting room, and share your screen.
- Access the [Zoom Test Meeting Room](#) to test out the software before joining an actual session.

If you encounter any technical difficulties, please contact the [FIU Canvas Help Team](#). Please ensure you contact support immediately upon the issue occurring.

Undergraduate Grading

MET3502 Undergraduate Course Grades Distribution Table				
Course Requirements	Number of Items	Points for Each	Total Points Available	Weight
Student Feedback Survey	1	100	100	5%
Discussion	1	100	100	15%
Quiz 1	1	100	100	10%
Quiz 2	1	100	100	10%
Quiz 3	1	100	100	10%
Quiz 4	1	100	100	5%
Quiz 5	1	100	100	15%
Quiz 6	1	100	100	15%
Quiz 7	1	100	100	15%
Total	9	N/A	900	100%

Graduate Grading

MET5561 Graduate Course Grades Distribution Table				
Course Requirements	Number of Items	Points for Each	Total Points Available	Weight
Student Feedback Survey	1	100	100	5%
Discussion & Term Paper (100 points)	2	100	200	15%
Quiz 1	1	100	100	10%
Quiz 2	1	100	100	10%
Quiz 3	1	100	100	10%
Quiz 4	1	100	100	5%
Quiz 5	1	100	100	10%
Quiz 6	1	100	100	10%
Quiz 7	1	100	100	15%
Total	10	N/A	1000	100%

Letter Grade Distribution Table					
Letter	Range%	Letter	Range%	Letter	Range%
A	95 or above	B	83 - 86	C	70 - 76
A-	90 - 94	B-	80 - 82	D	60 - 69
B+	87 - 89	C+	77 - 79	F	59 or less

Course Calendar

Module Dates	Topics, Readings, & Resources	Activities/Assignments Due
Module 1 Jan. 9-20 (2 weeks)	Lecture 1: Synoptic meteorology introduction Lecture 2: Skew-T Review	Discussion (your academic background and your favorite weather phenomenon): Available on Jan. 9, Due on Jan. 20. Quiz 1: Available on Jan. 9, Due on Jan. 20. Graduate Term Paper: Available on Jan. 9, Due on Apr. 21.
Module 2 Jan. 23-Feb.3 (2 weeks)	Lecture 3: Surface weather elements Lecture 4: Contour analysis Lecture 5: Forecasting temperatures	Quiz 2: Available on Jan. 23, Due on Feb. 3.
Module 3 Feb. 6-17 (2 weeks)	Lecture 6: Review of instrumentation and data sources Lecture 7: Airmasses, fronts, and frontal analysis Lecture 8: Interpreting weather maps	Quiz 3: Available on Feb. 6, Due on Feb. 17. Student Feedback Survey Quiz: Available on Feb. 6, Due on Feb. 17.
Module 4 Feb. 20-24& Mar. 6-10 (2 weeks)	Lecture 9: Math review: derivatives and integrals Lecture 10: Vectors and Del Operator Lecture 11: Curl, LaPlacian, Total Derivative, and Coordinate Systems	Quiz 4: Available on Feb. 20, Due on Mar. 10.
Module 5 Mar. 13-24 (2 weeks)	Lecture 12: Governing equations Lecture 13: Balanced wind Lecture 14: Divergence and vertical motion	Quiz 5: Available on Mar. 13, Due on Mar. 24.
Module 6 Mar. 27-Apr. 7 (2 weeks)	Lecture 15: Circulation and vorticity Lecture 16: Vorticity equation Lecture 17: Life-cycle of mid-latitude cyclone	Quiz 6: Available on Mar. 27, Due on Apr. 7.
Module 7 Apr. 10-21 (2 weeks)	Lecture 18: Potential vorticity Lecture 19: Cyclongenesis, QG Height Tendency and Omega equations Lecture 20: Applications of learned tools in evaluating and diagnosing vertical motion, upper-level troughs, and surface cyclones	Quiz 7: Available on Apr. 10, Due on Apr. 21.