AOS 452
The Frontal Cyclone Lab
Fall 2018 Syllabus

Instructor: Maria Madsen
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                                        (please begin subject line with '**AOS452**')

Meeting Time: **Tue/Thur ~2:30-4:30pm** Room 1411 AO&SS

Office Hours: **Mon 10-12:00p (or by appointment)**
                              Room 1421 AO&SS

Textbook: *Mid-Latitude Atmospheric Dynamics: A First Course*
                              Jonathan E. Martin

Class Website: http://marrella.aos.wisc.edu/aos452

Class Description

Over the past year, your study of atmospheric science has primarily focused on developing an understanding of dynamical, thermodynamical, and radiative transfer concepts. While many of these ideas may seem rather abstract on their own, together they provide a foundation for diagnosing the formation of atmospheric weather systems. Throughout this course, you'll acquire an arsenal of diagnostic and prognostic tools to use while assessing the evolution of mid-latitude weather systems. The lab portion of the course provides an opportunity for you to practice exercising the use of these tools and to increase your ability to confidently investigate the mid-latitude atmosphere.

Particular emphasis will be placed on fostering the clear articulation of your thoughts and ideas, as well. The field of atmospheric science continues to grow, as an understanding of weather and climate science is vital to the success and productivity of our society in many different ways. Consequently, the ability for atmospheric scientists to communicate that understanding is becoming more essential. Throughout lab, you'll have the opportunity to grow those communicative skills, both written, via lab assignments and case studies, and orally, through weather discussions and presentations.

Grading

Lab section will constitute 40% of your final grade for AOS 452. Your specific grade for lab section will be broken down into the following components:

Lab exercises (~13)	55%
Mini-case study	25%
Map & Forecast discussions	20%

Lab Exercises

There will be roughly 13 laboratory exercises this semester. The tentative schedule for these labs is included on the last page of the syllabus. Each lab will contain an assignment that is to be started in class and completed as homework. In general, each lab will be due **1 week** after it is handed out at the **beginning** of lab section, unless otherwise noted. You can work with a partner for most of the labs, but each person must answer the questions and perform the analyses *individually*. Labs turned in with remarkably identical analyses will be treated as plagiarism and both labs will earn zeros.

I understand that occasionally unforeseen circumstances (e.g. illness, family emergency, computer crash, etc.) may hinder your ability to meet the due date. As such, you will have **two "late days"** that you may use over the course of the semester. You may turn in one assignment two days late, or two assignments one day late each, without being penalized (going from Friday to Monday counts as one day instead of three). Alert me when you think you will use any late days before the assignment due date. Notifying me **after or on** the day the assignment is due is **unacceptable** and it will be **counted as late**. Copies of the labs will be posted to the lab section of the class website. These late days **do not apply to the case study assignment.**
            Upon using your two late days, no late assignments will be accepted.

Weather & Forecast Discussions

In-class map discussions will be an important component of your overall lab grade. You and a forecast partner will be responsible for 4 oral weather discussions to the class. More information on the expectations for these discussions, as well as a sign-up sheet, will be distributed during the first few weeks of class. Discussions and forecasts will begin **Thursday, 21 September.**

Mini Case Study

A portion of the laboratory section in this course is designed to prepare you for your Individual Case Study and to provide you with opportunities to synthesize the dynamical, diagnostic, and communicative tools acquired throughout the semester. One very important component of aquiring these skills is becoming an analyst. Consistent attention will be given to a mini case study assignment that will involve an examination of the pertinent dynamics relevant to a case selected by Prof. Martin and myself midway through the semester. We will build this case study over several weeks, beginning with a concise and informative synoptic overview that leads you to develop questions concerning the case as well as methods for attacking those questions. The goal is to bring you along step-by-step as you develop a rigorous diagnosis of a cyclone.

WxChallenge Forecasting Contest

As stated in the lecture syllabus, your participation in the WxChallenge is mandatory and does offer some performance incentives. For instance:
- **For every missed forecast after 4 misses, <u>you lose 1 point on your final grade.</u>**
- If you beat national consensus, you earn an additional point on your final grade.
- If you beat Prof. Martin or me, you earn 2 additional points on your final grade.
- If you beat **both** Prof. Martin and myself, you earn 4 additional points on your final grade.

Details regarding this contest will be discussed near the beginning of the semester. Please return your signup sheet and money to me no later than Thursday, 21 September. At the end of each forecast city (changes every two weeks) you will also turn in a brief summary of what your best

and worst forecasts were, and what you can do in the future to improve. **Forecasting begins Monday, 24 September**.

Academic Misconduct

Academic misconduct is taken very seriously in this class. The UW-Madison Student Assistance and Judicial Affairs office defines academic misconduct as:

Academic misconduct is an act in which a student: seeks to claim credit for the work or efforts of another without authorization or citation; uses unauthorized materials or fabricated data in any academic exercise; forges or falsifies academic documents or records; intentionally impedes or damages the academic work of others; engages in conduct aimed at making false representation of a student's academic performance; assists other students in any of these acts.

If you are suspected of academic misconduct, all parties involved will receive a zero for that particular assignment, Professor Martin will be informed, and appropriate steps will be taken.

Special Accommodations –

Students who need special accommodations for any reason need to provide an official visa from the McBurney Student Center to me by the end of the third week of class.

Additionally, if you have any questions, comments, or concerns – never hesitate to contact me throughout the course of the semester.

TENTATIVE LAB SCHEDULE

		Tuesday		Thursday
September			6	Lab Description Lab 1: Surface Analysis
	11	Lab 2: Upper Air Analysis	13	Lab 3: Forecast Prep and Model Decoding
	18	Lab 4: GEMPAK I: Surface and Sounding Programs	20	Lab 5: GEMPAK II: Gridded Data Programs
	25	Lab 6: GEMPAK III: Hints and Tricks **Introduce Mini Case Study (CS)**	27	**EXAM I** Lab 7: HTML and Website
October	2	Lab 7: HTML and Website	4	Lab 8: GEMPAK IV: C-Shell Scripts and 4-panel plots
	9	Lab 8: GEMPAK IV: C-Shell Scripts and 4-panel plots MCS Synoptic Description Due **Individual Analyses Due**	11	Lab 9: GEMPAK V: Automated Plot Generation
	16	Lab 10: Diagnosis of Vertical Motions MCS Questions and Method Due	18	In-class activity, Work Day Lab 10, Mini CS
	23	Work Day	25	**EXAM II** Discuss Final Case Study
	30	Lab 11: Vis5D I: The Basics	1	Lab 12: Vis5D II: Advanced Topics
November	6	Work Day **Deadline for Ind. Case Study Requests**	8	Lab 13: Sawyer-Eliassen Circulations **Mini Case Study Due**
	13	Work Day	15	Work Day
	20	**EXAM III** Ind. Case Study Work Day	22	**Thanksgiving**
	27	Work Day	29	Work Day

December	4	Ind. Case Study Work Day	6	***Ind. Case Studies due***Individual Case
	11	***Ind. Case Studies due***Individual Case Study Presentations		