Syllabus: Mesoscale Meteorology
Course ID# 19744 Credits: 3

Course Overview: *This course examines regional and local-scale (i.e. mesoscale) meteorological phenomena and the processes that drive them. Topics examined include cold air damming, lake effect snow, atmospheric instabilities, boundary layer phenomena, the dry line, and atmospheric convective storms (thunderstorms, squall lines, supercells, tornadoes).*

Instructor: Dr. Jana Houser Office: 1123 Derby
Email: houser.262@osu.edu Office hours: Mondays 10:30-12:30, Open door
**I will be working from the office on Mon and Wed. Other days of the week, I will be working remotely, but will be accessible by email and Zoom.*

Class Information: **Meeting Times:** Monday, Wednesday 12:45-2:05 (Derby 140)
Prerequisites: Geog 5941
Textbook: Strongly Recommended Text: *Mesoscale Meteorology in Midlatitudes* by Paul Markowski and Yvette Richardson. (I don't require it but will be following content of the book very closely!) **ISBN: 978-0-470-74213-6**

*PLEASE NOTE: If you email me a question that you can find the answer to on the syllabus, or online somewhere, I will refer you back to the syllabus without answering your question!

*IMPORTANT INFORMATION: If you have extenuating circumstances or are feeling ill, and you notify me BEFORE CLASS, I will run a Zoom for the class to enable remote participation.
Zoom Info: https://osu.zoom.us/j/95548619449?pwd=YnU5bTdQMGdBZGlTWkJOdWMvYjFlUT09
Meeting ID: 955 4861 9449 Password: 304642

***NOTE: This course is executed following the "Team-based Learning" pedagogical method. As such, there will be distinct differences between this course and the traditional lecture-style class.**

Recommended course equipment: In order to complete activities, it is strongly recommended that you purchase a digital pen that will allow you to write directly on the digital word document assignments. If you don't know where to start, I recommend the XP Pen (I personally have the Deco 01), which can be used very easily with Macs or Microsoft systems by simply plugging in the tablet to a USB port.

Course Goals: Students should be able to do the following upon successful completion of this course:

1) *Explain* the evolution and behavior of mesoscale weather phenomena and processes.
2) *Apply* basic atmospheric physics and equations governing mesoscale phenomena *to solve* phenomena specific problems.
3) *Evaluate* synoptic-scale and mesoscale weather conditions from map analyses and surface conditions in order to *predict* when and where various mesoscale phenomena are likely to occur.
4) *Synthesize* data from skew-T's, hodographs, and numerical forecast models to *identify* regions favorable for the development of mesoscale phenomena.
5) *Identify* and *analyze* mesoscale phenomena as they are occurring, and *predict* where the phenomena will occur 1-3 days in advance from local and national daily weather observations using surface, radar and satellite data.

Grading: Final grades will be assigned according to the standard system and **will not be curved** (In other words, if you have an 89.4% you earn a B+, not an A-):

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
>92.5%	89.5 – 92.5%	86.5 – 89.5%	82.5 – 87.5%	79.5 – 82.5%	76.5 – 79.5%	72.5 – 76.5%	69.5 – 72.5%	66.5 – 69.5%	62.5 – 67.5%	59.5 – 62.5%	<59.5%

Assessment:
Exams (2; 15% each): 30%
Final Project: 15 %
Weekly quizzes (in class): 25%
Weekly Homework: 20
Class participation: 10%

***Exams (30%)*:** There will be two exams for this course: two midterms during the semester (tentatively 2/15, and 4/5).
Final Project (15%): In place of a final exam, there will be a final project that will be assigned in late March. The project will require students to track the prospects of a severe weather outbreak for 3 consecutive days leading up to the event. More information and details will be posted on Carmen.
***Weekly quizzes (25%)*:** At the beginning of every **Monday's** class, there will be a quiz that will evaluate students' preparation for that week's material. The quiz will be taken twice, back to back, once independently and once in your group. Both grades will count for credit according to the percentages determined the first day of class. If you are absent, you can make arrangements to take the quiz individually if you contact me **within 24 hours** of the absence. If you are absent, your individual grade will also count as your group grade. You can have **two makeups** during the semester. If you are late to class, you will NOT be granted extra time to complete your quiz.
Weekly Homework (20%): Most weeks, there will be a homework assigned and available after class on Monday. Some weeks, depending upon the pace of classroom instruction time, you might be working on these problems during class. **Homework will be due on SATURDAY at 9:00 pm**. Late assignments will be accepted, but with a point deduction appropriate for the tardiness. Each day late will be a 5% point deduction. Homeworks will have varying point values, but each will be weighted equally into your final grade.
***Class participation (10%)*:** This is graded based upon group evaluation. Each group member will anonymously evaluate the others' preparation and participation in group quizzes and activities. The average of an individual's responses will be used as this grade unless there is an obvious outlier in the evaluations. See Group Evaluation Rubric handout or BB document.

Class Time: Monday's class will begin with the quiz, then will consist a series of 'mini lectures'. **You are expected to come to class on Monday having already read through the week's course materials, which will be on Carmen** no later than Thursday 5:00 PM the prior week. You will be polled to see what the 'muddiest topics' (i.e. the things that confuse you most) are, and the mini lectures will focus on explanations of these topics. For Wednesday's class, we will revisit topics that are not well understood and/or address student questions, we will do a series of group discussion questions, and if there is time, we will end by working on homework, which is due **by Saturday at 9:00 PM.** These questions are similar to exam questions and are therefore good study tools.

Attendance: Attendance is not directly a factor in a student's grade; however, reduced attendance will be reflected in their peer evaluation/class participation grade. Furthermore, if a student misses a class, they will receive a 0 for their quiz for that day unless they have contacted me in accordance to the statements in the 'Quizzes' section above. This work must be handed in by the following class period unless a longer medical leave is granted by a university physician. Other class members are not to be consulted about information presented in makeups. Only two such makeups will be allowed during the semester except for extenuating circumstances. After two missed classes, students will receive a 0 for missed materials unless there are special circumstances.

Inclement Weather:
In the case of inclement winter weather (**If there is a level 2 or level 3 snow emergency**), classes will transition to a virtual framework. The zoom link is found on the FIRST PAGE of the syllabus.

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct http://studentlife.osu.edu/csc/. Don't cheat. Don't copy. Don't plagiarize.
If academic misconduct is suspected, the professor reserves the right to impose one or both of the following consequences:
1. A grade penalty, such as an F, may be imposed on the project or in the course.
2. A formal student conduct referral may be filed with the Office of Community Standards and Student Responsibility.

*PLEASE NOTE: HAVING ANOTHER PERSON COMPLETE OR PROVIDE YOU WITH ANSWERED ASSIGNMENT OR EXAM QUESTIONS, INCLUDING MATERIALS FROM PAST YEARS IS CONSIDERED CHEATING **BY BOTH PARTIES** AND IS GROUNDS FOR ACADEMIC DISCIPLINE RANGING FROM RECEIVING A 0 ON THE ASSIGNMENT TO FAILURE OF THE COURSE
If a student is caught cheating *in any capacity* on any material, disciplinary action will be taken.

Student Accessibility:
The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Other Details, Policies and Procedures: Synoptic Forecasting

1. Classes will begin AT 11:10 whether you are here or not. Please try not to be late as this disrupts the class environment.
2. **Make-up exams will only be allowed if arrangements have been made PRIOR TO the exam date** and will only be accepted for extenuating circumstances.
3. **There will be no make-up for the final project**
4. Grades will be updated and posted on Canvas.
5. If you have special needs for any reason, please see http://www.ohio.edu/disabilities/ for information. I will only be able to grant you special permissions if you have the appropriate documentation of your disability and your needs.
6. **Cell phones and other electronic devices ARE ONLY PERMITTED** for use in the classroom or the lab for polling purposes, for completing assignments or if you have a specific need that requires their use. In such situations please notify me of your need and provide any university documentation that supports it.
7. **Students are expected to have their cameras ON during the entire duration of Zoom meetings if you are remotely attending.** I do not care if you just rolled out of bed, or if you are in last night's clothes, but I want to see your face, as do your classmates.

Important COVID-19 related information:

> If you feel sick, please do not come to class! If you receive a positive COVID test, please inform me as soon as you can, provide a copy for documentation (no sensitive information please!) and follow the medical advice you receive from health professionals.

Mental Health: As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org.

Diversity, Equity, Inclusion, and Harassment: This classroom is a SAFE SPACE. Harassment, mistreatment, bullying, and any other type of demeaning or discriminatory behavior will not be tolerated. If you create a hostile environment towards the professor or a fellow student, you may be asked to leave the classroom. The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Furthermore, violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at http://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu

2023 Course Outline:

*THIS SCHEDULE IS **SUBJECT TO CHANGE** PENDING LECTURE PACE, TIME CONSTRAINTS AND OTHER UNFORESEEN CIRCUMSTANCES

Week	*Class Dates*	*Topics*	*Reading*	*Quiz #*	*HW #*
1	1/8-1/14	Welcome, syllabus, intro, Cold Air Damming **(REMOTE 1/9, Asynchronous video lecture 1/11)**	Ch 1, 13.1, 13.2	No Quiz	No Homework
2	1/15-1/21	**1/16 – NO CLASS (MLK Day)** Lake Effect Snow	Ch 4.5	Quiz 1	HW 1
3	1/22-1/28	Radar Primer	Appendix	Quiz 2	HW 2
4	1/29-2/4	Static stability, Skew-T's, hodographs	Ch 3.1, 3.1.1, 2.6, 2.7	Quiz 3	HW 3
5	2/5-2/11	Boundary Layer	Ch 4.1-4.4	Quiz 4	HW 4
6	**2/12-2/18**	The Dryline **Exam 1 2/15: all material 1/8-2/13**	Ch 4.7	Quiz 5	**No HW**
7	2/19-2/25	Nocturnal Low-level Jet	Ch 5.2	Quiz 6	HW5
8	2/26-3/4	Limitations of Parcel Theory, Convection Initiation	Ch 3.1.2 7,	Quiz 7	HW 6
9	3/5-3/11	Thunderstorm structure, Ordinary and Multicell Convection, Supercell intro	Ch 8.1 - 8.3	Quiz 8	HW 7
10	3/12-3/18	**NO CLASS – Spring Break**		**NO Quiz**	**No HW**
11	3/19-3/25	Supercell forecasting, Supercells Structure	Ch 8.4	Quiz 9	HW 8
12	3/26-4/1	Supercell Dynamics 1	Ch 8.4, 2.5	Quiz 10	HW 9
13	4/2-4/8	Supercell Dynamics 2 **Exam 2 4/5**	Ch 10.1	Quiz 11	**No HW**
14	4/9-4/15	Tornadoes	Ch 10.2, 10.3	Quiz 12	HW10
15	4/16-4/22	Mesoscale Convective Systems	Ch 9	Quiz 13	**HW 11**
16	4/23-4/24	Built in time for falling behind, or Hazards (hail, lightning)		**NO QUIZ**	**NO HW**
	5/2 – FINAL PROJECT	**PROJECT DUE: 1:45**			