Phys. 360: Introduction to Weather Analysis

Location and Time: M & W 9:30AM–10:45AM at 119 Natural Science Building.
Instructor: Jian Du-Caines
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E-mail: jian.du@louisville.edu
Office hours: M & W 1:00PM–3:00PM or by appointment.

Course summary:
A study of day-to-day weather patterns with an emphasis on understanding the basics of meteorological processes, forecast preparation, and mastery of hand data analysis. The course is towards teaching techniques of weather analysis by manual construction of weather maps (e.g., reading data and plotting maps, identifying fronts, low and high pressure systems, wind shift lines, and air masses), interpreting observations, understanding the physics of the weather processes, and the structure of circulation patterns. At the end of the course, the goal is the students should have a general knowledge of weather analysis techniques and data collection, basic understanding of the common meteorological processes, and how human and numerical weather forecasting works.

Course objectives:
• Students should have a specific knowledge of atmospheric processes and phenomena found at the synoptic scale, for example: fronts and mid-latitude cyclones.
• Students will acquire a general working knowledge of reading and drawing weather maps, Skew T log P sounding diagrams.
• Students will become familiar with the fundamental equations of meteorology and their implications.
• Students will have an understanding of atmospheric circulation patterns and related forces in the planetary boundary layer and free atmosphere.
• Students will gain knowledge of kinematics including wind shear and a non-linear flow, vorticity and divergence with associated vertical motions, as well as numerical weather prediction.

Course objectives will be met by attending lectures, reading the textbook, working homework assignments, asking questions in class, and taking exams.

Suggested Reading Materials
“Weather Analysis & Forecasting Handbook”, by Tim Vasquez
“Weather Analysis”, by Dušan Djurić

Prerequisites: Math 205.
Important Dates for Fall 2015

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<tr>
<th>Event</th>
<th>Date</th>
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<tr>
<td>Classes start</td>
<td>Aug. 24 (Mon)</td>
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<tr>
<td>Last day of registration</td>
<td>Aug. 24 (Mon)</td>
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<tr>
<td>Last day to drop/add</td>
<td>Aug. 28 (Fri)</td>
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<td>Labor Day holiday</td>
<td>Sept. 7 (Mon)</td>
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<tr>
<td>Last day to apply for degree</td>
<td>Sept. 16 (Wed)</td>
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<td>Mid-term break</td>
<td>Oct. 5-6 (Mon-Tues)</td>
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<td>Last day to withdraw</td>
<td>Oct. 26 (Mon)</td>
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<td>Thanksgiving break</td>
<td>Nov. 25-29 (Wed-Sun)</td>
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<tr>
<td>Last day of classes</td>
<td>Dec. 7 (Mon)</td>
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<td>Reading day</td>
<td>Dec. 8 (Tues)</td>
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<td>Final exams</td>
<td>Dec. 9-15 (Wed-Tues)</td>
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<td>Degree date</td>
<td>Dec. 15 (Tues)</td>
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<td>Commencement</td>
<td>Dec. 18 (Fri)</td>
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General Lecture Schedule

Chapter 1 Introduction and review: Conceptual Models of the Lower Atmosphere
Chapter 2 Meteorological Observations
Chapter 3 Analysis of Weather Maps
Chapter 4 Kinematics – winds and forces
Chapter 5 Thermal wind


Chapter 6 Jet stream and Jet streak
Chapter 7 Skew T Log P diagram
Chapter 8 Air Masses and fronts
Chapter 9 Mid-latitude Cyclones
Chapter 10 Mesoscale storms
Chapter 11 Weather Forecasting process

Final: Fri., Dec. 11, 8:00AM - 10:30AM

Grading Scheme
Weighting: 40% homework, 25% mid-term exam, 30% final exam, and 5% for class attendance.

There is weekly homework due at the beginning of the Wednesday class.
No late homework will be accepted.
All exams are close-booked.

Make-up exams will only be given for valid university excuses, and may be in a different format from the regularly scheduled exam. Planned absences during an exam, such as for university sponsored travel, should be addressed as early as possible
Extra credit: 10 points. Take a picture of each cloud type (which will be reviewed in Chapter 1), and state the location, the date and time, and the weather condition when the pictures are taken. Put all materials into a single file in the format of power point, word,
or PDF. This report is due before 5:00pm on December 7, 2014 (last day of class).

**Grading**
Grades will be determined by the following grading scale.
A+ 97%  A  93%  A- 90%  
B+ 87%  B  83%  B- 80%  
C+ 77%  C  73%  C- 70%  
D+ 67%  D  63%  D- 60%  
F < 60%

**A note on Academic Integrity and Plagiarism**
Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at the University of Wyoming, and all students are expected to act in accordance with this principle. Consistent with this expectation, all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts. Academic integrity includes a commitment not to engage in or tolerate acts of plagiarism, falsification, misrepresentation, or deception. Such acts of dishonesty violate the fundamental ethical principles of the academic community and compromise the worth of work completed by others. Evidence of plagiarism may result in expulsion from the course (with an F grade) as well as dismissal or suspension from the University of Louisville.

**Students with disabilities**
If you have a physical, learning, or psychological disability and require accommodations, please let the instructor know as soon as possible or contact the UofL Disabilities Resource Center directly.

**Title IX/Clery Act Notification**
Sexual misconduct (sexual harassment, sexual assault, and sexual/dating/domestic violence) and sex discrimination are violations of University policies. Anyone experiencing sexual misconduct and/or sex discrimination has the right to obtain confidential support from the PEACC Program 852-2663, Counseling Center 852-6585 and Campus Health Services 852-6479.

Reporting your experience or incident to any other University employee (including, but not limited to, professors and instructors) is an official, non-confidential report to the University. To file an official report, please contact the Dean of Student’s Office 852-5787 and/or the University of Louisville Police Department 852-6111. For more information regarding your rights as a victim of sexual misconduct, see the Sexual Misconduct Resource Guide ([http://louisville.edu/hr/employeerelations/sexual-misconduct-brochure](http://louisville.edu/hr/employeerelations/sexual-misconduct-brochure)).

*The instructor reserves the right to make changes in the syllabus when necessary to meet learning objectives, to compensate for missed classes, or for similar reasons.*