

COURSE SYLLABUS

Meteo 201 (3 Credits)

Introduction to Weather Analysis

Fall 2004

Course Objective. The objective of this course is to provide a systematic, scientific introduction to the types of weather data available to the meteorologist and the public, the manner in which these data are collected, and some of the ways in which the data are displayed, analyzed, and used by operational meteorologists. The course is intended for freshman and sophomore meteorology majors and for others with a serious interest in using real-time weather data in their professional or recreational activities.

Time/Place. Lecture: Monday and Wednesday, 8:00 - 8:50 AM, all sections, 112 Walker Bldg.

Lab: Section 1, Wednesday, 12:20 PM – 2:15 PM, 608 Walker Bldg
Section 2, Tuesday, 3:35 PM – 5:30 PM, 608 Walker bldg
Section 3, Wednesday, 3:35 PM – 5:30 PM, 608 Walker Bldg
Section 4, Monday, 3:35 PM – 5:30 PM, 608 Walker Bldg
Section 5, Thursday, 3:35 PM – 5:30 PM, 608 Walker Bldg

Instructor. Dr. John W. Diercks. **E-mail.** diercks@ems.psu.edu

Office. 620 Walker Bldg, 863-6089.

Office hours. Monday, Wednesday, and Friday, 9:00 - 10:00 AM; Tuesday and Thursday, 8:00 – 9:00 AM; plus most other times if the office door is open.

Worldwide Web. This syllabus is available on the Worldwide Web at <http://www.ems.psu.edu/~diercks/syllabusmeteo201.html>.

Required Texts.

1. Nese, J.M. and L.M. Grenzi, 2001: *A World of Weather: Fundamentals of Meteorology*. 3d Edition, Kendall Hunt Publishing Co., Dubuque, Iowa
2. Gleim, I.N., 2002: *Aviation Weather and Weather Services*. 4th Edition, Gleim Publishing Inc., Gainesville, Florida
3. *Introduction to Weather Analysis and Forecasting* by Greg Forbes and Jon Merritt (available at Penn State Bookstore).

Exam policy. There will be two semester exams and a final exam. The semester exams will be given during regular class periods as scheduled in the syllabus below. The final exam will be comprehensive and will be given in the period scheduled by the University.

Except for illness, make-up exams will be permitted only for students who make arrangements with the instructor prior to the scheduled exam.

Academic integrity. Dishonesty on exams, quizzes, or assignments will not be tolerated. This course follows the College of Earth and Mineral Sciences' academic integrity policy (see <http://www.ems.psu.edu/students/integrity/statement.html>). Specifically, the first cheating infraction will result in a score of zero on the examination, quiz, or assignment in which the violation occurred, and a second violation will result in an F grade for the course.

Grading policy. The semester exams will contribute a maximum of 20 points each to the final grade, the final exam will contribute 30 points, and the lab assignments together will contribute 30 points. There will be four announced or unannounced quizzes during lecture periods that will be included in the lab grade. The quiz scores combined will carry the weight of one lab.

Two semester exams = 40 points maximum

Final comprehensive exam = 30 points maximum

Lab assignments = 30 points maximum

Total = 100 points maximum

Lab assignments:

1. Lab assignments will be due on the date specified by your lab instructor. They will be returned and discussed during the following lab period.
2. There will be a 20% penalty for late labs. No late labs will be accepted after they have been returned and discussed in class unless prior arrangement has been made with the lab instructor.
3. Labs that are poorly organized, messy, or difficult to read will be penalized accordingly.
4. Technical soundness and grammatical structure will be considered in lab grades.

Reading assignments. The source of each reading assignment precedes the assigned pages. For example, "Nese" refers to a reading assignment from *A World of Weather: Fundamentals of Meteorology*.

| Day | Date | Topic | Reading Assignment |
|----------|-------------|--|---|
| W | 9/1 | Meteorological Observations | Nese: 1-20, 76-79, 93-95, |
| W | 9/8 | a. The observing system b. The weather variables | 161-164 Gleim: 7-20, 45-47, 63-72 Forbes: 1-7, Appendix A |
| M | 9/13 | Surface Data Analysis | Nese: 75-76, 95-104, 127-131 |
| W | 9/15 | a. Surface plotting model | Gleim: 20-25, 29-33, |
| M | 9/20 | b. Surface weather map interpretation: pressure and wind | 227-246, 295-306 |
| W | 9/22 | c. Weather depiction chart d. METAR code e. Altimetry | Forbes: 30 - 33 |
| M | 9/27 | Remote Sensing: Satellite and Radar Analysis | Nese: 35-40, 45-53 |
| W | 9/29 | a. Satellite imagery | Gleim: 253-257, 307-313 |
| M | 10/4 | b. Radar imagery | Forbes: Chap 3 |
| T | 10/5 | Voluntary review for Exam I (6-7 PM, location to be announced) | |
| <u>W</u> | <u>10/6</u> | <u>Exam I (material through 10/4)</u> | |
| M | 10/11 | Upper-air Data Analysis | Nese: 127-131 (Review) |
| W | 10/13 | a. Constant pressure charts | Gleim: 144-148, |
| M | 10/18 | b. Upper-air rawinsonde data c. Plotting soundings d. Upper-air maps | 314-326 Forbes: Chap 5 |

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| W | 10/20 | Hydrostatic Stability and Skew-Ts | Nese: 155-161, 179-187 |
| M | 10/25 | a. Skew-T basics | Gleim: 55-61 |
| W | 10/27 | b. Plotting skew-Ts c. Parcel theory d. Convective available potential energy (CAPE) | Forbes: Chap 7 |
| M | 11/1 | Stability and Convection | Nese: 206-210 |
| W | 11/3 | a. Stability Indices b. Convective charts and bulletins | Gleim: 292-294, 327-336, 359-361 |
| M | 11/8 | Large-scale Midlatitude Surface Weather Features | Nese: 75-76, 103-108 |
| W | 11/10 | a. Low pressure systems b. High pressure systems c. Air masses and fronts d. Clouds and precipitation e. Cross sections f. Other features | Gleim: 73-92 |
| R | 11/11 | Voluntary review for Exam II (6-7 PM, location to be announced) | |
| <u>M</u> | <u>11/15</u> | <u>Exam II (material through 11/10)</u> | |
| W | 11/17 | Cyclogenesis and Anticyclogenesis | Nese: 317-329, 293-299, 131-135 |
| M | 11/22 | a. Surface/upper-air connection | |
| M | 11/29 | b. Norwegian cyclone c. Divergence and vorticity d. Thermal considerations e. Cyclolysis and anticyclolysis | Forbes: Chap 6 |
| W | 12/1 | Tornadoes | Nese: 387-402 |
| M | 12/6 | Lake Effect Snow | Nese: 477-479 |
| W | 12/8 | Cold Air Damming and Coastal Fronts | Nese: 474-477 |
| TBD | | Voluntary review for final exam (Time, date, and location to be announced.) | |
| TBD | | Final Comprehensive Exam, 112 Walker Bldg (Time and date to be announced.) | |