

**METEOROLOGY LECTURE SYLLABUS**

(subject to revision)

| DATE    | CLASS NO. | TOPIC  | ASSIGNMENTS |                                       |
|---------|-----------|--|-------------|---------------------------------------|
|         |           |  | Text        | CD-ROM Tutorials                      |
| Aug 28  | 1         | Introduction to Meteorology  | 1-15        |                                       |
| 30      | 2         | History of Meteorology   | 23-26       |                                       |
| Sept. 1 | 3         | The Upper Atmosphere I   | 16-19       | Radiation                             |
| 7       | 4         | The Upper Atmosphere II  | 26-29       |                                       |
| 8       | 5         | Origin of the Atmosphere   | 20-23       | Doppler Radar                         |
| 11      | 6         | The Seasons  | 30-42       | Earth-Sun Geometry                    |
| 13      | 7         | Diurnal Changes  | 43-53       |                                       |
| 15      | 8         | Heat Budget and Energy Balance                                     | 54-91       |                                       |
| 18      | 9         | Water Vapor Content of Air   | 120-142     |                                       |
| 20      | 10        | <b>(TEST 1* [classes 1-8]; Origin, Upper Atm. &amp; Radiation)</b> |             |                                       |
| 22      | 11        | Adiabatic Processes I  | 142-146     |                                       |
| 25      | 12        | Adiabatic Processes II   | 415-416     |                                       |
| 27      | 13        | Dew and Frost  | 146-147     |                                       |
| 29      | 14        | Fogs   | 148-155     |                                       |
| Oct. 2  | 15        | Cloud Development  | 156-160     |                                       |
| 4       | 16        | Stability/Instability I  | 160-165     | Stability                             |
| 6       | 17        | Stability/Instability II   | 165-168     |                                       |
| 11      | 18        | Cloud Types  | 169-187     |                                       |
| 13      | 19        | Precipitation Processes I  | 188-202     | Precipitation                         |
| 16      | 20        | Precipitation Processes II   | 202-209     |                                       |
| 18      | 21        | <b>(Test 2* [9-20]; Water Vapor and Stability)</b>                 |             |                                       |
| 20      | 22        | Forces Which Produce Winds   | 92-104      | Pressure Gradients                    |
| 23      | 23        | Wind Directions and Speeds   | 105-119     | Coriolis                              |
| 25      | 24        | Global Circulation Patterns  | 210-220     | Forces and Winds                      |
| 27      | 25        | Upper Air Flow   | 220-225     | Upper Level Winds                     |
| 30      | 26        | Second Order Circulations  | 226-233     | El Nino-S. Oscillation                |
| Nov. 1  | 27        | Third Order Circulations   | 233-253     |                                       |
| 3       | 28        | Air Masses   | 254-264     |                                       |
| 6       | 29        | Fronts   | 264-275     |                                       |
| 8       | 30        | Mid-Latitude Cyclones  | 276-284     | Mid-Latitude Cyclone                  |
| 10      | 31        | Surface and Upper Air Flow   | 284-305     |                                       |
| 13      | 32        | Weather Forecasting  | 386-427     | Forecasting                           |
| 15      | 33        | <b>(Test 3 * [22-32]; Winds, Jets and Fronts)</b>                  |             |                                       |
| 17      | 34        | Atmosphere Electricity   | 306-314     |                                       |
| 20      | 35        | Thunderstorms I  | 314-326     |                                       |
| 27      | 36        | Thunderstorms II   | 327-329     |                                       |
| 29      | 37        | Tornadoes I  | 330-344     |                                       |
| Dec. 1  | 38        | Tornadoes II   | 344-351     |                                       |
| 4       | 39        | Hurricanes I   | 352-364     |                                       |
| 6       | 40        | Hurricanes II  | 364-385     |                                       |
| 8       | 41        | Air Pollution  | 428-449     | Orbital Variations and Climate Change |
|         |           |  | 486-509     |                                       |
| 11      | 42        | Atmospheric Optics   | 512-522     |                                       |

\* Copies of recent exams are kept on reserve in the Library.

Final examination when scheduled by the Registrar. The final examination is comprehensive, although it emphasizes the last part of the course.

**Texts:** Understanding Weather and Climate, 4th ed., Aguado and Burt, 2007.

**Web Site for Text:** <http://www.prenhall.com/aguado>

**Programs from Riverside Scientific used in this course:** Seasons, Winds, Clouds, and Storm Systems

**Other programs used in this course:** McIDAS and ArcView 3.2

**METEOROLOGY LABORATORY SYLLABUS**  
(subject to revision)

**Fall, 2006**

| <u>DATE</u> | <u>CLASS</u> | <u>TOPIC</u>                | <u>ASSIGNMENT<br/>from Text</u>  |                |
|-------------|--------------|-----------------------------|----------------------------------|----------------|
| Aug. 29     | 1            | Computer Resources          |                                  |                |
| Sept. 5     | 2            | Weather Instruments         |                                  |                |
|             |              | temperature                 | 78-86                            |                |
|             |              | pressure                    | 98-100                           |                |
|             |              | wind                        | 114-115                          |                |
|             |              | moisture                    | 138-140                          |                |
|             |              | clouds                      | 169-179                          |                |
|             |              | precipitation               | 202-206                          |                |
|             | 12           | 3                           | Station Plotting                 | 525-529        |
|             | 19           | 4                           | Contouring Weather Maps          |                |
|             | 26           | 5                           | Analysis of Weather Maps I       |                |
| Oct. 3      | 6            | Analysis of Weather Maps II |                                  |                |
|             | 17           | 7                           | Pseudoadiabatic Diagrams         | 86-87; 168-169 |
|             | 24           | 8                           | Balloon launch                   |                |
|             | 31           | 9                           | Balloon launch                   |                |
| Nov. 7      | 10           | Balloon launch              |                                  |                |
|             | 14           | 11                          | ArcGIS: Hurricanes I             |                |
|             | 21           | 12                          | ArcGIS: Hurricanes II            |                |
|             | 28           | 13                          | McIDAS: Soundings and Meteograms |                |
| Dec. 5      | 14           | Weather Map Analysis        |                                  |                |

Web sites for viewing the current weather at Moravian College:

[www.physics.moravian.edu/weather](http://www.physics.moravian.edu/weather)

[www.wunderground.com/weatherstation/WXDailyHistory.asp?ID=KPABETHL10](http://www.wunderground.com/weatherstation/WXDailyHistory.asp?ID=KPABETHL10)

[www.findu.com/cgi-bin/wxpage.cgi?CW2112](http://www.findu.com/cgi-bin/wxpage.cgi?CW2112)

**Final Grade composed of:**

|                               |     |
|-------------------------------|-----|
| Lecture Test # 1.....         | 13% |
| Lecture Test # 2.....         | 13% |
| Lecture test # 3.....         | 13% |
| Lab and Homework Average..... | 40% |
| Final Examination.....        | 21% |

**Attendance Policy:** Attendance will be taken in each class period. Absences in excess of four will reduce a student's grade by one percentage point for each class period missed. Students have the responsibility to secure and present evidence of the nature of an excused absence.

**Equipment necessary:** A set of colored pencils and a pencil with an eraser. Bring them to every laboratory. The use of colored pencils in lecture is also recommended.

**Cell phones** and beepers should be turned off in the Earth Science classroom.

**BlackBoard:** All meteorology students should enroll themselves in the EASC 120 BlackBoard site.

**Plagiarism:** Matters of plagiarism in this course are governed by the definitions, policies, and procedures given on the appropriate pages of the latest edition of the *Moravian College Student Handbook*.

**Objectives:** Students will understand the following:

- composition and properties of the permanent and variable constituents of the atmosphere.
- role of geometry, radiation, and water vapor in the Earth's energy balance.
- methods by which atmospheric properties are measured, portrayed, analyzed, and predicted.
- forces that affect air flow near the surface and aloft, and the weather systems that result.
- effects of the atmosphere on humans, and vice versa.
- dynamics of the atmosphere at various temporal and spatial scales.

Dr. Joseph Gerencher, Office: Room 112, CHS, Phone: 610- 861-1440, e-mail:gerencher@moravian.edu  
Office Hours: MWF 11:00-11:30; Tuesday 1-3 p.m.; Other times by appointment.