

## Geo 203

### GEO 203 Syllabus of Record WEATHER FOR K-8 PRESERVICE TEACHERS

Text: *The Atmosphere* by Lutgens and Tarbuck

Lab Manual: *Project Earth Science: Meteorology* by National Science Teachers Association

#### Tentative Course Outline:

Week	Topic(s)	Reading	Lab (chapter) in <i>Project Earth Science</i>
<b>GENERAL CHARACTERISTICS</b>			
1	Characteristics and Composition of the Atmosphere	C 1	D2, A3, A4, A5: Components, Particles
2	Seasons	C 2	A6: Insolation
3	Weather Parameters	C 3, 4	A9, A12, A13, A14, A15: P, T, Clouds, Precipitation, Gathering and presenting data; contouring data
4		C 5, 6	
5		Atmospheric Circulation	C 7
<b>WEATHER PATTERNS AND PREDICTION</b>			
6	Air Masses and Fronts,	C 8,9	A16: Moving Masses, WeatherCycler
7	Weather Maps and Images		
8	Weather Patterns	C 12	Atmosphere, A17: Interpreting Weather Maps
<b>SEVERE WEATHER</b>			
9	Thunderstorms and Tornadoes	C 10	<i>DataStreme</i> C 11: Thunderstorms and Tornadoes NOAA <i>Student Activities in Meteorology</i> Activity 3
10	Hurricanes	C 11	A 19: Chasing Hurricane Andrew
<b>LONG-TERM CLIMATE CHANGE</b>			
11	Climates	C 15	<i>Real Reasons for Season</i> Activities 5 and 6
12	Changes over geologic and historic time	C 14	Dept. of Geology Activities
13	Greenhouse Effect/Global Warming	C 2, 14	NOAA <i>Student Activities in Meteorology</i> Activities 5 and 6: Greenhouse and Ozone/Volcanoes/Cooling
<b>HUMAN INTERACTION</b>			
14	Effects of Polluted Air	C 13	Monitoring Air Pollution in West Michigan
15	Human Impacts	C 14	<i>Investigating Air</i> Activities 1 and 2
16	FINAL		

Course Objectives: The student will:

apply content knowledge about atmosphere, weather, and climate to solve problems and describe systems,

demonstrate confidence in presenting science in the classroom,

utilize different methods to teach science and assess learning,

compile existing teaching resources and construct new inquiry-based classroom activities, and

demonstrate fluency in Michigan science standards and familiarity with the MI Educational Assessment Program.

The information presented on the Topics listed above will be presented in the framework of the Michigan Essential Goals and Objectives for Science Education (K-12). See: Strand V. Using Scientific Knowledge in Earth Science (at [http://www.michigan.gov/documents/MichiganCurriculumFramework\\_8172\\_7.pdf](http://www.michigan.gov/documents/MichiganCurriculumFramework_8172_7.pdf) ). And Content Standard 3 (see attached). This framework will prepare you for teaching the Michigan Department of Education’s Science Content Standards.

**Nature of the Course:**

This course will require you to working cooperatively in teams, solve problems, and think critically and creatively to actively explore atmospheric conditions and characteristics, weather patterns, seasonal changes in the weather, climates zones, weather patterns, storms, polluted air, human impacts, and long-term changes in the atmosphere. Methods will include hands-on/”minds-on” experiences, inquiry-oriented investigations, constructivism, concept maps, group discussions, demonstrations, and student presentations. The World-Wide-Web will be used as a resource for information. Students will learn by doing instead of passive observation (i.e., standard lecture format). Hands-on, inquiry-based cooperative learning will not be limited to scheduled labs and may also be done during scheduled “lecture” time.

**Grades:**

Mid-term test	100
Final	100
Lab exercises/work (15 at 10 points each)	150
Lesson plan	100
Portfolio	50
	500 points

Prentice Hall has a webpage (<http://cwx.prenhall.com/bookbind/pubbooks/lutgens3/>) dedicated to Lutgens and Tarbuck’s *The Atmosphere*. It contains short answer questions and questions that require critical thinking. There will be a mid-term and final (100 points each). Both tests will be 100 points and consist of multiple choice, short answer, and short essay questions. Questions will reflect the Michigan Essential Goals and Objectives for Science Education (K-12) and the Michigan Test for Teacher Certification.

Lab is designed to compliment the material presented in lecture by conducting demonstrations, hands-on activities and experiments. Each week there will be graded lab exercises ranging from participating in class or fieldtrips to written exercises from the manual (about 13 labs at 15 points each). All written materials are due at the start of the follow lab.

Each student must develop an ORIGINAL Earth Science lesson plan for a 45-minute class period. Lesson plans will follow the constructivist model and consist of: a written one-page outline describing the lesson (due at midterm); a completed written lesson plan (submitted on paper and via email prior to your class presentation), and an in-class 15 minute (abbreviated) presentation of the lesson you developed. Samples of lesson plans are available at <http://www1.gvsu.edu/mattoxs/landforms.html>. Your lessons should include line drawings,

diagrams, or photos (as needed) that are in the public domain (i.e., not copyrighted). Links to web resources are welcome. You will need to provide one copy of your completed lesson to each classmate.

Course grades will be on a fixed scale of  $>93.3\% = A$ ,  $90\%-93.3\% = A-$ ,  $89.9- >86.6 = B+$ ,  $86.6- >83.3 = B$ ,  $83.3-80\% = B-$ ,  $79.9- >76.6 = C+$ ,  $76.6- >73.3 = C$ ,  $73.3-70\% = C-$ ,  $69.9- >66.6 = D+$ ,  $66.6- >83.3 = D$ ,  $<60\% = F$ .

Attendance. Although attendance will not be taken, students are expected to arrive at class on time and participate fully in all lectures, labs, discussions and activities. Absenteeism will directly affect your grade by its effect on your assignments, tests, and labs because these materials will be based on material covered in class. Missed tests CANNOT be made up except in cases of prolonged, serious, excused illness.

Extra Credit (choose one for a possible maximum addition of 30 points):

1. Attend a professional meeting: Michigan Science Teachers Association, National Science Teachers Association. or 2. Join a state or national education or teaching association (e.g., MSTA, NESTA, NSTA).

All students and the teacher are expected to be aware of and follow

GVSU's rules of Academic Honesty. See: <http://www.gvsu.edu/acad/acadreg1.html>