

I. IDENTIFYING INFORMATION

Course: GEO 131 Weather and Climate (3 hrs) Must take GEO 111 for lab science credit

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Hours: to be announced

Prerequisites: none

Text: Gillespie, Netoff, and Tiller, 2006, *eWeather and Climate* (**CD incl. with lab manual**)

Lab Manual: Netoff, *Weather and Climate* (2003 ed.)

Other Materials: notebook, pen, pencil, paper, calculator

II. GENERAL COURSE DESCRIPTION

The basic concepts of meteorology and climatology are introduced. Atmospheric temperature, pressure, winds, moisture, and air masses and storms are systematically covered, followed by an overview of the major climates and ecosystems of the earth. Environmental problems are considered where pertinent.

III. COURSE OBJECTIVES

The student should be able to (1) demonstrate a basic knowledge of patterns of atmospheric temperature, pressure, circulation, moisture, airmasses, storms and global climates, (2) analyze selected types of weather data and weather maps (3) interpret a variety of climatic data.

IV. GRADING POLICIES

Three exams will be given, each carrying 1/3 of the course grade. Labs are separate. **All exams are 100 questions and 50 minutes long (incl. final).** All exams require Scantron 882ES forms. No extra credit. Exams focus on material from the lectures and text and **emphasize** material from the previous 5-week module.

All exams must be taken. Failure to take all lecture exams results in automatic course grade of "F".

Grading scale: 85-100% = A; 75-84% = B; 60-74% = C; 50-59% = D

Students with a disability which may affect their academic performance can arrange for a conference with the instructor *within the first two weeks* of the semester in order that appropriate strategies can be considered.

V. ATTENDANCE POLICY

The University requires each instructor to keep a record of student attendance. Attendance will be taken at the beginning of the hour. **Tardies count as absences.** This class operates under the premise that an important part of the learning process takes place in the lecture portion of the course. Therefore, class attendance and participation are strongly encouraged.

Nine class hours of absence are allowed without penalty (6 T-day classes, 9 M-day classes). Absences in excess of 9 class hours result in course failure; I will not grade exams of students who have exceeded the absence limit.

VI. CLASS CONDUCT

Any individual action that is perceived to be detrimental to the learning environment of the class will receive one warning then will be dropped from the class. This includes such things as **excessive talking, excessive tardies, sleeping, leaving class during lecture, interrupting the lecture, use of cellular phones**, etc.

VII. CHEATING, DISHONESTY, AND PLAGIARISM

.....will not be tolerated, and may, as a minimum, result in course failure

- VISITORS**

Visitors (family, friends, etc.) are allowed in class *only by pre-arrangement* with the instructor

IX. COURSE CONTENT

Overview (CD, Chapter 1.... the CD is a 450+ page text and is included with the lab manual in a pocket)

- Earth's place in the universe
- maps - (read lab manual, Chapter 1)

Air temperature (CD, chapter 2)

- solar radiation -- nature, properties, fate
- factors controlling radiation absorbed
 - insolation -- earth-sun relationships RRIP
 - nature of absorbing medium -- blackbody radiators
 - wavelength of radiation--selective absorbers, greenhouse effect
 - heating and heat-transfer processes
- vertical, horizontal and temporal variations

Air pressure and winds (CD, chapter 3)

- causes of atmospheric pressure and importance
- measurement and forms of expression
- vertical changes in pressure
- horizontal -- mechanical vs. thermal origin
- wind direction and speed
- high and low pressure cells (anticyclones and cyclones)
- global pressure and wind systems
- local wind systems
- upper level winds and jetstreams

EXAM #1 (approx. at end of 5th week of classes) 100 questions; 50 min. length

Moisture in the atmosphere (CD, chapter 4)

- uniqueness of water
- humidity
- cooling processes -- radiation, conduction, mixing, adiabatics
- mechanisms to create uplift -- convection, convergence, orographic, frontal
- conditions that favor or discourage uplift -- stability vs. instability
- condensation and precipitation
 - forms -- dew, fog, clouds, frost
 - precipitation processes
 - forms of precipitation
- global patterns of precipitation

Airmasses and storms (CD, chapter 5 and 6)

- airmass source regions and characteristics
- modifications of airmasses
- North American airmasses
- fronts and frontal cyclones -- origin, development, types
- violent storms -- thunderstorms, tornadoes, hurricanes

EXAM #2 (approx. at end of 10th week of classes) 100 questions; 50 min. length

Climate and ecosystems (CD, chapter 7)

- climatic classification
- climatic types and climate – vegetation – soil relationships

Climatic change (CD, chapter 8)

- Quaternary climatic change -- the evidence, possible causes
- climatic future of the earth

EXAM #3 (100 question, 50 minute final during scheduled final exam hour)