

GEOGRAPHY 361: WEATHER & CLIMATE I
DEPARTMENT OF GEOGRAPHY, PLANNING & RECREATION
COLLEGE OF SOCIAL & BEHAVIORAL SCIENCES

GENERAL INFORMATION:

Course: GGR 361, Weather and climate I, Section 1, 3 credit hours
Term: Fall, 2004
Classroom: Bldg 82, SWFSC room 17
Time/day: 9:10 to 10:00 MWF
Instructor: Dr. Leland Dexter
Office hours: 10:20 – 11:10 & 12:40 – 1:30 M & W or other times by 24 advanced appointment
Office: Bldg 82, SWFSC room 205
Phone: 523-6535
E-mail: lee.dexter@nau.edu
Web: <http://www.geog.nau.edu/~lrd>

PREREQUISITES:

None, however this course will be more rewarding with some science/math background. We will perform algebra based computations in exercises and on exams. Prospective students with little previous science/math experience are urged to consider more introductory level courses.

COURSE OVERVIEW:

Weather and Climate examines the processes and patterns found in the earth's atmospheric system. The courses also examine the effect weather and climate has on the environment in which we live. The weather component (GGR 361, Weather and Climate I) focuses on short-term energy, atmospheric motion and moisture considerations along with weather forecasting. The next course in the sequence (GGR 362 Weather and Climate II) will treat climate, climate change, microclimates, energy balance and instrument techniques.

This course will be largely lecture-based however I try to include support from web-based map discussions (usually done at the start of each day's class), occasional slide shows and videos, occasional demo-days where equipment will be brought into the classroom, and periodic workshop days which are lab-like exercises that we work through together as a class. You will follow the weather during the course of the semester during the execution of your individual projects. Finally, we will also try to do a half-day field trip to our local NWS office in Bellemont.

COURSE OBJECTIVES:

The specific objectives of the course are to prepare students:

- To be able to analyze, describe, and diagram the basics of major atmospheric processes including energy, pressure, wind, precipitation, air masses, fronts, and storm systems.
- To be able to perform basic calculations pertinent to these processes (fundamental algebra skills assumed).
- To be able to describe and diagram how these processes are linked in a system.
- To be able to analyze, describe and diagram the spatial patterns of weather systems.
- To be able to describe some of the impacts of weather on human activity.
- To be able to make use of sophisticated weather information to assist in planning your daily life.
- To be able to develop a 24-hour forecast based on naked-eye observations.
- To develop an appreciation for the beauty and power of weather.

COURSE REQUIREMENTS:

- A high level of student cooperation and participation.
- Attendance of lectures with topics on background physics, weather factors and processes, weather instrumentation, weather nomenclature and classification, and the spatial distribution of weather phenomena. Overhead transparencies, map discussions, instrument-based demonstrations, slides, and videotapes, will be used to enhance visualization of the subject matter.
- Assigned readings from the required text.
- In-class hands-on workshop exercises.
- A World Wide Web based homework project.
- A half day field trip to the Flagstaff NWS office in Bellemont.
- Two in-term exams about 70% lecture based; 30% text, videos etc.
- One comprehensive final exam.

PROFESSOR'S PHILOSOPHY:

Across the spectrum of all of my professorial roles, my principal focus is teaching. I consider myself to be a dedicated and enthusiastic instructor. I am considered to be demanding in expectations but fair in grading and evaluation by most of my past students. My classes tend to be rich in content and I present a lot of material from which to learn. For a specific list of materials and learning approaches used in this class, see the teaching style attachment later in the syllabus. In return for the amount of work I put into resource and class preparation, I expect you to be willing to work hard in absorbing as much of the material as you can. I would much rather work with an interested and enthusiastic C or D student than a bored and uncooperative A or B student. If you work from this attitude, you and I will get along just fine. If, on the other hand, you view your university experience as simply paid admission to a diploma, you and I may have conflicting objectives and attitudes.

To this end, some of the points awarded in this class reflect how seriously you approach the learning process as a cooperative endeavor. Items included in this group of points are attendance, punctuality, enthusiasm and cooperation. Some of these points will be objectively tracked (e.g. attendance) and some are my subjective opinion. You will all start out with the maximum number of points pre-awarded in this area. As the end of the class approaches, a demerit system will be used if you have been deficient in these areas.

COURSE POLICIES:

See the attached sheets on general NAU policies.

Students are expected to attend each class meeting and tardiness is discouraged. To this end occasional spot attendance checks will be made and these checks will be incorporated into the cooperation portion of your grade.

While a certain amount of collaboration among students is encouraged in this class, each student is expected to complete his or her own assignments. Anyone found plagiarizing assignments or cheating on exams will fail the course.

MATERIALS:

Edward Aguado and James E. Burt (2004) *Understanding Weather & Climate 3rd ed.* Prentice Hall, Upper Saddle River, New Jersey. (Required reading).

Dexter, L.R. (2004) *Weather and Climate Lecture Supplement.* Scholargy Publishing (Required note supplement).

Jack Williams (1992) *The Weather Book 1st or 2nd ed.*, Vintage Books, Random House, New York. (Optional)

Reliable access to the Internet with color printing and/or R/W CD capability
 A scientific calculator will be a great help
 A 3 ring notebook to contain the Coyote Printing Co. packet.
 A few colored pencils, a ruler and a clean eraser will help with the in class exercises.

GRADING:

- First in-term exam, 100 points *
- Second in term exam, 150 points *
- Final exam 200 points **
- 1 WWW project (You will need consistent and reliable Internet access), 200 points.
- Field trip, 50 points
- Approximately 6-7 in-class exercises 30 points each **
- Student cooperation 100 points

* Makeups allowed only with valid excuse and prior instructor approval.

* Exams may not be started after the first person leaves the room.

** Absolutely NO makeups, all work must be done at the appointed time.

Total possible points, approximately 1000 depending on the final number of in-class exercises completed.

The following grade scale will be applied to the final point total:

A > 90%, B > 80%, C > 70%, D > 60% F < 60% total possible points
 or curved to the class distribution if needed.

TENTATIVE SCHEDULE:

Aug 30-Sep 3	Introduction , energy, matter & systems	Ch 1, 2
Sep 6	Labor Day holiday, no class	
Sep 8-10	Energy, matter and systems, Earth's orbit	Ch 1, 2
Sep 13-17	Earth's orbit and energy budget	Ch 2, 3
Sep 20-22	Heat and temperature in the troposphere	Ch 3
Sep 24	Dexter at MSI conference w/ GGR 457 (Exam #1)	
Sep 27-Oct 1	Heat and temperature in the troposphere (cont)	Ch 3
Oct 4-8	Pressure and winds	Ch 4
Oct 11-15	Pressure and winds	Ch 8
Oct 18-22	Atmospheric moisture	Ch 5, 6, 7
Oct 25-27	Atmospheric moisture	Ch 5, 6, 7
October 29	Dexter at AGIC Conference	
Nov 1	Exam # 2	
Nov 3-5	Air masses and fronts	Ch 9
Nov 8-12	Storm systems	Ch 10, 11, 12
Nov 15-19	Storms systems	Ch 10, 11, 12
Nov 22-24	Analyzing and forecasting the weather	Ch 13
Nov 26	Thanksgiving holiday, no class	
Nov 29-Dec 3	Analyzing and forecasting the weather	Ch 13
Dec 4 (Sat)	½ day field trip to the NWS office in Bellemont	
Dec 6-10	Optical Phenomena, climate overview	Ch 17
Dec 15	Final exam (#3), Wednesday 7:30-9:30	

DETAILS OF THE WORLD WIDE WEB PROJECT:

One of the most truly useful aspects of the World Wide Web is the ability to access large amounts of timely and sophisticated weather data, maps and analyses. In the past, accessing such data from private providers was quite costly. Today, several universities and government agencies provide sophisticated products at no cost. The timeliness of the web data makes these products especially useful to an informed and interested private citizen who can now access to the same background data that professional meteorologists use in making their forecasts.

We will make extensive use of the datasets available across the web to serve two purposes:

- 1) Tracking current and developing weather patterns.
- 2) As a source of real-world conditions to emphasize points developed in lecture.

We will start early in the semester with the first use of the web. I will distribute a single web address that we will all use. You will access this site at least once every week (more credit will be awarded if you access the site on the same day of each week). Spend some time looking at the map and then dump the map to a printer. Collect all of your maps and include them in sequential order in a binder. You will end up with about a dozen maps tracing the surface weather for the coterminous 48 states over the semester.

Secondly, as we encounter various topics that can be enhanced by viewing a specific product or two on the web, I distribute addresses that you will access and print out copies of the requested products. Alternatively you may turn the entire project in digital format (you will need to do this on ZIP disk or burned CD).

The project is worth 200 class points graded as follows:

Completeness	50 points
Neatness of presentations	50 points.
Organization of the material	50 points.
Discussion and technical content	50 points

The same grading criteria will be applied to either hard-copy or digital submissions.

NORTHERN ARIZONA UNIVERSITY POLICY STATEMENTS

SAFE ENVIRONMENT POLICY

NAU's Safe Working and Learning Environment Policy seeks to prohibit discrimination and promote the safety of all individuals within the university. The goal of this policy is to prevent the occurrence of discrimination on the basis of sex, race, color, age, national origin, religion, sexual orientation, disability, or veteran status and to prevent sexual harassment, sexual assault, or retaliation by anyone at this university. You may obtain a copy of this policy from the college dean's office. If you have concerns about this policy, it is important that you contact the departmental chair, dean's office, the Office of Student Life (523-5181), the academic ombudsperson (523-9368), or NAU's Office of Affirmative Action (523-3312).

STUDENTS WITH DISABILITIES

If you have a learning and/or physical disability, you are encouraged to make arrangements for class assignments/exams so your academic performance will not suffer because of the disability or handicap. If you have questions about special provisions for students with disabilities, contact the Counseling and Testing Center (523-2261). It is your responsibility to register with the Counseling and Testing Center. Application for services should be made at least eight weeks before the start of the semester. If the Counseling and Testing Center verifies your eligibility for special services, you should consult with your instructor during the first week in the semester so appropriate arrangements can be made. Concerns related to noncompliance with appropriate provisions should be directed to the Disability Support Services coordinator in the Counseling and Testing Center.

INSTITUTIONAL REVIEW BOARD

Any study involving observation of or interaction with human subjects that originates at NAU-including a course project, report, or research paper-must be reviewed and approved by the Institutional Review Board (IRB) for the protection of human subjects in research and research-related activities. The IRB meets once each month. Proposals must be submitted for review at least fifteen working days before the monthly meeting. You should consult with your course instructor early in the course to ascertain if your project needs to be reviewed by the IRB and/or to secure information or appropriate forms and procedures for the IRB review. Your instructor and department chair or college dean must sign the application for approval by the IRB. The IRB categorizes projects into three levels depending on the nature of the project: exempt from further review, expedited review, or full board review. If the IRB certifies that a project is exempt from further review, you need not resubmit the project for continuing IRB review as long as there are no modifications in the exempted procedures. A copy of the IRB Policy and Procedures Manual is available in each department's administrative office and each college dean's office. If you have questions, contact Carey Conover, Office of Grant and Contract Services, at 523-4889.

ACADEMIC INTEGRITY

The university takes an extremely serious view of violations of academic integrity. As members of the academic community, NAU's administration, faculty, staff, and students are dedicated to promoting an atmosphere of honesty and are committed to maintaining the academic integrity essential to the educational process. Inherent in this commitment is the belief that academic dishonesty in all forms violates the basic principles of integrity and impedes learning. Students are therefore responsible for conducting themselves in an academically honest manner. Individual students and faculty members are responsible for identifying instances of academic dishonesty. Faculty members then recommend penalties to the department chair or college dean in keeping with the severity of the violation. The complete policy on academic integrity is in Appendix F of NAU's Student Handbook.

GGR 361 WEB RESOURCES

University sites:

University of Illinois

[http://ww2010.atmos.uiuc.edu/\(Gh\)/wx/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/wx/home.rxml)

Ohio State University

<http://asp1.sbs.ohio-state.edu/>

San Francisco State University, California Regional Weather Server

<http://virga.sfsu.edu/>

Portland State University, Including the "Make Your Own" product menu

<http://cyclone.plymouth.edu/>

WeatherNet at University of Michigan

<http://cirrus.sprl.umich.edu/wxnet/>

Western Regional Climate Center at University of Nevada, Reno

<http://www.wrcc.sage.dri.edu/>

Federal Government Sites:

National Weather Service Offices by clickable map and by list. This is a very comprehensive access to NWS functions including the Severe Storms Lab (NSSL), Climate Prediction Center (CPC), National Hurricane Center (NHC) etc.

<http://www.wrh.noaa.gov/wrhq/nwspage.html>

Arizona Sites:

Arizona State Weather Roundup (Hourly Conditions)

<http://www.wrh.noaa.gov/cgi-bin/getproduct.pl?FLGPHXSWRAZ>

Flagstaff National Weather Service Office

<http://nimbo.wrh.noaa.gov/flagstaff/>

Arizona SNOTEL Summary

<ftp://ftp.wcc.nrcs.usda.gov/data/snow/update/az.txt>

Office of the State Climatologist (at ASU)

<http://geography.asu.edu/azclimate>

NAU real-time weather station

<http://art.artsci.nau.edu/~nauws>

Commercial Sites:

The Weather Channel

<http://www.weather.com/twc/homepage.twc>

Unisys (formerly the Purdue University WXP site)

<http://weather.unisys.com/>

Intellicast

<http://www.intellicast.com/>

Weather Tutorials:

Encyclopedia of the Atmospheric Environment
<http://www.doc.mmu.ac.uk/aric/eae/enter.html>

WW2010 at University of Illinois
[http://ww2010.atmos.uiuc.edu/\(Gh\)/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/home.rxml)

Prentice Hall website to accompany our textbook
<http://cw.prenhall.com/bookbind/pubbooks/aguado2/>

Weather Equipment:

<http://www.weatherconnect.com>

Specific Products Used in this Course:

Basic US Surface map:

<http://www.weather.com/twc/homepage.twc>
http://weather.unisys.com/surface/sfc_map.html
http://weather.unisys.com/satellite/sat_sfc_map.html

Surface Map Animated Loop:

http://weather.unisys.com/images/sat_sfc_map_loop.html

Upper Air Balloon Soundings (Stuve or SkewT plots):

<http://cyclone.plymouth.edu/make.html>
http://weather.unisys.com/upper_air/skew/index.html
<http://asp1.sbs.ohio-state.edu/>

Upper Air Maps:

<http://asp1.sbs.ohio-state.edu/>
http://weather.unisys.com/upper_air/index.html

Jet Stream Maps:

<http://www.weatherimages.org/data/imag192.html>
<http://www.nckcn.com/homepage/mhennes/Jetstream.htm>
http://virga.sfsu.edu/gif/jetstream_init_00.gif
<http://apollo.lsc.vsc.edu/weather/hemis.html>

Satellite Image Products (stills):

http://weather.unisys.com/satellite/sat_ir_west.html
http://weather.unisys.com/satellite/sat_ir_east.html
http://weather.unisys.com/satellite/sat_wv_west.html
http://weather.unisys.com/satellite/sat_wv_east.html
http://weather.unisys.com/satellite/sat_ir_us.html
http://weather.unisys.com/satellite/sat_wv_us.html

Satellite Image Products (loops):

http://weather.unisys.com/satellite/sat_ir_west_loop-12.html
http://weather.unisys.com/satellite/sat_ir_east_loop-12.html
http://weather.unisys.com/satellite/sat_wv_west_loop-12.html
http://weather.unisys.com/satellite/sat_wv_east_loop-12.html
http://weather.unisys.com/satellite/sat_ir_us_loop-12.html
http://weather.unisys.com/satellite/sat_wv_us_loop-12.html

Current Flagstaff Forecast Discussion:

<http://www.wrh.noaa.gov/cgi-bin/getproduct.pl?FLGPHXAFDFLG>

Current Flagstaff Radar:

<http://www.intellicast.com/Local/USLocalWide.asp?loc=kflg&seg=LocalWeather&prodgrp=NEXRADimagery&product=BaseReflectivity&prodnave=none>
<http://www.wrh.noaa.gov/flagstaff/radarreplace.shtml>

Forecast Models:

<http://weather.unisys.com/eta/index.html>
<http://weather.unisys.com/ngm/index.html>
<http://weather.unisys.com/aviation/index.html>
<http://weather.unisys.com/ecmwf/index.html>
<http://weather.unisys.com/mrf/index.html>
<http://asp1.sbs.ohio-state.edu/>

AGREEMENT OF UNDERSTANDING:

I have read the course syllabus for GGR 361, Weather & Climate I. I have had the opportunity to ask questions about the syllabus and course. I understand the content of the syllabus and agree to be responsible for the requirements and course policies.

Signature _____

Printed name _____

SSN _____

Detach and turn in before the end of the second week of class to avoid administrative drop.