UTEP GEOG 3306, *WEATHER AND CLIMATE*

Course Reference Number 14977

SYLLABUS *version 1.1*

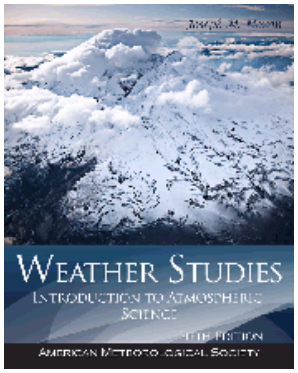
Wednesday 3:00 to 4:20 PM and online, Fall Semester 2014

Geological Sciences Building, Room 320

Instructor: Dr. Tom Gill **Office:** GEOL 401A. **Phone:** 915-747-5168. **email:** tegill@utep.edu.
Office hours: TBA: and by appointment. **Appointments are encouraged. I reserve the right to not be able to see you if you come by outside of office hours without an appointment. I will be out of town on university business and unavailable on some days this semester.**

Course Description: Study of the composition, structure, energy flows, and motions of the Earth's atmosphere on a range of scales, the physical principles of meteorology, weather phenomena, and climate. Physical principles of atmospheric phenomena are stressed to understand weather and climate's impact on humans, particularly with regard to severe weather.
Prerequisite: GEOG 1306 OR GEOL 1211 OR GEOL 1213, or department/instructor approval.

Texts: *Weather Studies: Introduction to Atmospheric Science,* by Joseph M. Moran (American Meteorological Society), 5th edition, ISBN 978-1-935704-95-9 (print) and 978-1-935704-78-2. YOU MUST HAVE THE FIFTH EDITION OF THE TEXTBOOK!
AND ALSO REQUIRED, *Weather Studies E-Investigations Manual,* (American Meteorological Society), ISBN: 978-1-935704-77-5 YOU MUST HAVE THE 2014-2015 EDITION OF THE INVESTIGATIONS MANUAL. THE INVESTIGATIONS MANUAL IS ELECTRONIC ONLY.
You must have the book *and* the investigations manual by Wednesday, September 2. The American Meteorological Society and (hopefully) the UTEP bookstore sells both of them together as a package, for a discount. For e-book and e-manual, see http://bookstore.ametsoc.org/WSESP : for printed book and e-manual, see http://bookstore.ametsoc.org/WSSP
Chapter 1 ONLY of the fifth edition of the book is available online at:
http://www.ametsoc.org/amsedu/online/info/samplecourse/Ch01_5th.pdf
Additional readings will be assigned.



Additional Requirements:
In order to participate in this course, the following requirements must be met:

- Internet connection. You will need to access an Internet page regularly in this class (see below). This is a three credit course that is considered half-online, so you must be able to go online to complete the course.

- Weather makes sense if you follow it, so you will be expected to visit the Online Weather Studies page (see below) every day during the week if possible. *There may be pop quizzes to make sure you have accessed this information!*
- Computer and software with the ability to **download**, **display**, and **print** Graphical Image Files (.gif) and text files (.html and .txt) from the Internet.

This course will follow to a large extent the American Meteorological Society's Weather Studies curriculum.

Every week, in addition to

(1) Attending the lecture every Wednesday afternoon in the Geological Sciences building, you must also
(2) Go online at UTEP (to Blackboard) and review the additional lecture material posted there for each week,
(3) Complete an Investigation or Investigations from the E- Investigations Manual, AND
(4) Access the Weather Studies online homepage, review material there, and complete additional Investigation or Investigations called "Current Weather Studies."

The Weather Studies online homepage may be accessed by the following address, or through the course homepage at UTEP: (This information should be
http://www.ametsoc.org/amsedu/login.cfm
Gain access by inputting your ID and password, and clicking on "LOGIN".

The login ID and password will be supplied by Dr. Gill. If you lose it, you will need to contact Dr. Gill to access this information!

Each university following this course (such as UTEP) has a unique ID and password.

Once you access the Online Weather Studies homepage, each boxed item under the major headings is an active link to the information identified by that title.

The Online Weather Studies home page includes the following information:

The Daily Weather Summary.

Weekly Weather/ Climate News

Supplemental Information

"Current Weather Studies." This will include some of the week's homework assignment(s) from the Investigations Manual and answer sheet(s). There will be one or two homework assignments from the Investigations Manual every week.

"Math Skills" and "Critical Thinking and Diversity" exercises. You are encouraged to read each week's "Math Skills" and "Critical Thinking and Diversity" exercises. There MAY be quizzes, regular assignments, and/or extra credit assignments given based on the Math Skills and Critical Thinking / Diversity exercises.

Student Resources - which will include many weather maps, forms, links, and diagrams.

- **Learning**

  The following steps summarize the weekly routine you are expected to follow to complete this course (in addition to attending the scheduled course meetings).

  - Maintain a daily watch/observation of weather (a) to follow the development and progress of major weather systems and features, and (b) to relate the local weather in El Paso to the bigger-scale weather picture. This watch can be conducted in a number of ways including bringing up the Online Weather Studies Homepage Daily Summary and other maps and images, viewing weather broadcasts on television or radio, and accessing the home page of the National Weather Service's El Paso office, at **http://www.srh.noaa.gov/elp** .
  - Read the chapter in text on which the week's study is based. Questions/review material are provided in the book at the end of each chapter and on Blackboard by Professor Gill each week to help you access your understanding of the material. IT IS BEST IF YOU READ THE CHAPTER IN THE BOOK BEFORE THAT WEEK'S LECTURE(s)!

- Each weekday, if possible, access the Online Weather Studies home page and read that day's Daily Weather Summary, Supplementary Information, and (once each week) Weekly Weather and Climate News, Math Skills, and Critical Thinking and Diversity exercises.
- Access the course web page on Blackboard every week, and download and read each week's Learning Objectives, Online Lecture, and Lecture Summary. By the end of each chapter's lectures, make sure you have learned and can understand each one of the Learning Objectives, and have read and understood the Lecture Summary and that week's Online Lecture. The tests will include almost all of their questions specifically related to and derived from the Learning Objectives for each week.
- After reviewing the in-class and online materials for each chapter, complete the Investigation(s) assigned by Dr. Gill in the "E-Investigations Manual," and turn them in by the due date (generally the start of next week's class).
- After reviewing the in-class and online materials for each chapter, go to the Online Weather Studies Homepage to acquire additional course study material. Call up on-screen and print the appropriate "Current Weather Studies" (generally available by 10 AM Wednesday El Paso time), and any of the Images 1-3 that are highlighted. You may also print the Daily Summary and Supplemental Summary Files too, but this is not required. Complete and hand in the "Current Weather Studies" investigations as directed by Professor Gill. You may also wish to file these printed products following the study investigation material to which they are related.
- Follow the instructions provided by Professor Gill for handling your learning materials.

Each of the different learning files is described below.

- *Daily Summary*

The Daily Summary is an overview describing the weather pattern across the United States and the location of major weather systems. It is updated once a day (Monday through Friday) and is generally available by 5:00 am El Paso time. The summaries of a particular week remain active links for the entire week till Sunday evening.

- *Supplemental Information*

  In addition to the Daily Summary, Dr. Edward Hopkins of the American Meteorological Society will often provide an additional file of supplemental information that expands on a point of the summary material or adds background information on meteorological topics via the Supplemental Information file. It can be displayed, read, and printed (if desired) whenever the position is highlighted.
- *Online Investigation File- also may be listed as "Current Weather Studies"*

  Since weather is most exciting in real time, the Online Investigation File "Current Weather Studies" is designed to build upon (in near real-time) concepts found in the course assignments from your E-Investigations Manual each week. This file is a .pdf file that contains approximately 5 to 7 questions relating to the weather images you display on screen and print. These files are available starting about 10 AM (El Paso time) on Mondays and/or Wednesdays. When requested, place your responses to the questions on the Investigation Answer Form that is delivered on the Online Weather Studies Homepage and print it out and turn it in by the due date
- *Images*

  The different Image 1, Image 2, etc. files contain the maps, images, and charts you will need to complete the questions found in the Online Investigation File "Current Weather Studies." While there are always three image positions listed, only those highlighted contain images accompanying the investigation which need to be printed. The images associated with each Online Investigation File are delivered Mondays and Wednesdays at the same time the Online Investigation File is made available (about 10 AM, El Paso time).
- *Critical Thinking/Diversity/ Math Skills*

  Meteorology is a physical science which requires knowledge of mathematics, although advanced math is not required for students in this course. Still, to succeed in today's world, it pays to be as mathematically literate as possible. The Math Skills weekly exercises will help reinforce mathematical concepts and

include special concepts of particular relevance in studying the weather. The Critical Thinking/Diversity component first defines critical thinking, and then examines a specific critical thinking cognitive skill and an affective attribute that relate to each week's investigations. An activity that models some aspect of critical thinking is described and suggestions are made concerning ways in which critical thinking can be applied more generally to topics or issues that are not part of the science content of the course. Our theme for these applications is diversity. We do this because our nation is becoming increasingly diverse and our educational process has the potential of benefiting significantly by being more inclusive. Diversity is an issue that impacts all of us and in which there are many ideas to explore. Finally, it is a topic about which most of us have a great deal to learn.

Extras

The Blackboard site may be used to provide some important extras for this course. On the Blackboard page for this class will be a set of important links you will want to refer to throughout the semester. There will also be links to view and download an additional online lecture almost every week, Learning Objectives, summaries of material, Dr. Gill's lecture notes for each chapter, and links to additional reading assignments that may be given.

Several miscellaneous materials are available through the "EXTRAS" section of the Online Weather Studies homepage. Blank plotting maps, meteorological graphs, additional weather information sources, and additional notes on the homepage products are given here. These "EXTRAS" include, among others,

- Weather Map Symbols
- The National Weather Service's Weather Glossary
- Additional Links
- Various Diagrams
- Self-scoring practice multiple-choice tests for each chapter

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Course Objectives: A three-credit one-semester course cannot in itself rigorously cover all aspects of meteorology and climatology in detail, but will be at least sufficient to impart to the student a background survey of scientific knowledge of the atmosphere. This course is to provide you with a basic scientific understanding of weather and climate. **For a more detailed understanding, each week's lectures here in this class would easily be covered by an entire semester's class in another university's Atmospheric Science department required to attain a college degree in meteorology!**

By successfully completing this course, you should have a working understanding of the weather we experience and the processes that produce it.

Specifically, this includes the ability to understand and describe the following and more:

- Methods and techniques for monitoring weather and measuring the properties of the atmosphere.
- The composition and structure of the atmosphere.
- Solar and earth radiation and how the atmosphere receives and distributes energy.
- Air pressure, winds, and atmospheric circulation on a number of scales.
- The nature and behavior of moisture in the atmosphere, clouds, and precipitation.
- Air masses and fronts.
- Cyclones, anticyclones, and other weather systems.
- Severe storms including thunderstorms, tornadoes, and tropical cyclones.
- Climate, how it differs from weather; how we study climate and what factors influence the climate.

Course Format: This class will include lectures, discussions, a large amount of online material, reading and homework assignments, tests, potential laboratory/field exercises, and/or opportunities for individual research. The course schedule will not be written in stone (more like written in air?) because every opportunity will be taken to utilize the actual literal atmosphere of El Paso outside the classroom to illustrate concepts, terms, and phenomena. When interesting or explicable atmospheric phenomena are occurring or observable outside the window, we may take time to adjourn to the hallway or outdoors to observe, discuss, illustrate, and explain what is happening. Guest

lectures from practicing atmospheric scientists will be incorporated into the class if available and as the schedule permits.

Attendance and Grading: Attendance will not be taken but is strongly encouraged; part of the grade will be based on class participation and discussion. Pop quizzes may be given for which attendance at lecture is required. Students are expected to participate in the lectures and keep the classroom interactive. Students who are absent are responsible for everything covered in the class, for announcements, and for changes in schedule if any. *If you know you cannot come to class on a particular day, please let Dr. Gill know in advance!* Some of the material covered in class, online, and on the tests will NOT be in the book, and some of the material from the book will NOT be covered in class, online and exams. You will be responsible for both. The final grade will be based on:
40% Homework/ exercises, in-class assignments (including pop quizzes), and class participation
40% Tests One and Two (Each test counts 20%)
20% Final Exam (Test Three) (Final will only be 25% comprehensive, see last page of syllabus)

● *Planned Letter Grading*: A ≥ **90**% of top score; B **80**-**89**% of top score; C **70**-**79**% of top score; D **60**-**69**% of top score; F < **60**% of top score.

Policy on Late Homework/ Assignments: NO homework or other assignments will be accepted late except for reasons other than illness or injury (doctor's note required), the instructor's prior approval, or when a student is required to be on official University or government business (documentation required).

Policy on Make Up Examinations: NO make-up exams will be given for reasons other than illness or injury (doctor's note required), absence with the instructor's prior approval, or when a student is required to be on official University or government business (documentation required). Make-up exams will be scheduled at a future date.

Students with Disabilities: If you have (or think you may have) a disability, and need accommodation, contact the Disabled Student Services Office (DSSO) at (915) 747-5148 (voice or TTY), visit their office in Union East Room 106, or by E-Mail at dss@utep.edu. DSSO is the office at UTEP that is designated to determine eligibility for accommodations and services to students with disabilities, and will arrange for any necessary accommodations.

Academic (dis)honesty and other issues: Academic dishonesty is prohibited and considered a violation of the UTEP Handbook of Operating Procedures. It includes but is not limited to cheating, plagiarism, and collusion. In this class, since it is an upper division science course, you are expected to complete your own work, but consultation with your classmates and others (collaboration) is encouraged though not required on homework assignments and exercises (but NOT for tests).

Please either turn off or set to silent mode your cell phones and pagers on silent mode. In case of emergencies when you need to take a call please leave the room quietly and courteously.

EXPECTED Course Outline:

NOTE: This schedule is fluid, just like the atmosphere, and could change based on the needs, requirements and opportunities of the students, professor, availability of guest lecturers, and the actual atmospheric conditions and phenomena which may be observable or happening on any given day.

Reading of various chapters from the book is required for each week of lecture and online study below. You will be expected to do the readings and access the Online Weather Studies home page, as well as Blackboard, in advance of the lecture. The lectures are considered an adjunct/illustration of the readings and online material, and may not always match what is in the text or the online material. Assignments of problems from the textbook and/or Online Weather Studies investigations manual and/or home page will be given almost every week. Additional readings may be assigned: you will be responsible for knowing the material in them.

READ CHAPTER #	**DATE**	**TOPIC**
	AUG 27	Introduction to the Course
1	SEPT 3	Basics of Monitoring Weather
2	SEPT 10	The Atmosphere- Origin, Composition, Structure
3	SEPT 17	Solar and Terrestrial Radiation
4	SEPT 24	Heat, Temperature, and the Atmosphere
	OCT 1	TEST 1- on chapters 1 through 4
5	OCT 8	Air Pressure
6	OCT 15	Humidity, Saturation, and Stability
7	OCT 22	Clouds, Precipitation, and Weather Radar
8	OCT 29	Wind Systems and Weather
	NOV 5	TEST 2- on chapters 5 through 8
9	NOV 12	Planetary Circulation of the Atmosphere
10	NOV 19	Weather Systems of the Mid Latitudes
11	NOV 26	Thunderstorms and Tornadoes
12	DEC 3	Hurricanes and Tropical Weather
	MONDAY DECEMBER 8 AT 1:00 PM	TEST 3, during the final exam period- on chapters 9, 10, 11, and 12.