GEOL 1340-001 (2 credit Lecture) and 1340-011 (1 credit Lab) – Weather and Climate

This course satisfies the University of Arlington core curriculum requirements in Life and Physical Sciences

Instructor: TBA
Office Number: TBA

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Faculty Profile: TBA
Office Hours: TBA

Teaching Assistant: TBA
Email Address: TBA
Office Hours: TBA

Section Information:
Lecture: GEOL1340-001
Labs: GEOL1340-011

Time and Place of Class Meetings:
TBA

Required Textbooks:

Course Description:
Nature and variability of weather and climate, including wind, temperature, clouds and precipitation, droughts and flooding. Storm systems, fronts, thunderstorms, tornadoes, hurricanes. Atmospheric chemistry and air pollution. Mean climate, seasonal variations and climatic change.
# Course content:

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Lecture Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Monitoring Weather</td>
</tr>
<tr>
<td>2</td>
<td>Atmosphere: Origin, Composition, and Structure</td>
</tr>
<tr>
<td>3</td>
<td>Solar and Terrestrial Radiation</td>
</tr>
<tr>
<td>4</td>
<td>Heat, Temperature, and Atmospheric Circulation</td>
</tr>
<tr>
<td>5</td>
<td>Air Pressure</td>
</tr>
<tr>
<td>6</td>
<td>Humidity, Saturation, and Stability</td>
</tr>
<tr>
<td>7</td>
<td>Clouds, Precipitation, and Weather Radar</td>
</tr>
<tr>
<td>8</td>
<td>Wind and Weather</td>
</tr>
<tr>
<td>9</td>
<td>Atmosphere’s Planetary Circulation</td>
</tr>
<tr>
<td>10</td>
<td>Field Trip to National Weather Service Dallas/Fort Worth</td>
</tr>
<tr>
<td>11</td>
<td>Weather Systems of Middle Latitudes</td>
</tr>
<tr>
<td>12</td>
<td>Thunderstorms and Tornadoes</td>
</tr>
<tr>
<td>13</td>
<td>Tropical Weather Systems</td>
</tr>
<tr>
<td>14</td>
<td>Weather Analysis and Forecasting</td>
</tr>
<tr>
<td>15</td>
<td>Climate and Climate Change</td>
</tr>
<tr>
<td>16</td>
<td>Light and Sound in the Atmosphere</td>
</tr>
<tr>
<td>17</td>
<td>Climate Classification</td>
</tr>
</tbody>
</table>
Assessment of Learning Outcome - Course Policies and Grading:

Grading:
Lecture Portion: 75% of course
Lab Portion including signature project: 25% of course

Lab Portion: 15% of course
Signature Assignment 10% of course
Lecture Portion: 75% of course

Lecture Portion:
Quizzes (3) 10% of course (3.3% each)
Exams (3) 45% of course (15% each)
Final Exam 20% of course

Final grade calculation:
0.25 x lab + 0.10 x quizzes + 0.45 x exams + 0.20 x final exam
Score will be translated into a grade based on class average.

Grades will not be released over the phone or by email. Grades must be either obtained in person or from the UTA online database.

Exams: Exams will be mostly multiple-choice questions, but the final exam will also contain essay questions. No early exams are allowed.

Exams must be taken at the scheduled time. Make-up exams can only be taken in cases of illness or family emergency. A note from the University disciplinary officer or doctor may be required in these cases. Students who do not take an exam receive zero points as a grade on that exam. Make-up exams are scheduled and set by the instructor.

Quizzes:
Lecture quizzes are not announced. The 3 best quizzes will be counted towards the total grade. There are no make-up quizzes.

Fieldtrip (recommended): Fieldtrip is recommend for the signature project. Participation will result in 20% extra credit on the signature assignment.

Weather and Climate Project (signature project): A signature research assignment in the area of weather and climate is part of the core curriculum assessment and is designed to stimulate critical thinking skills, teamwork, communication and empirical and quantitative skills. Weather and climate data (e.g. temperature, precipitation) will be gathered for the field project and analyzed in a research report. Total length of the report for each team will be four pages, letter size, single-spaced, 12 pt Times New Roman font including graphs and references. Each team will give a 10-minute presentation on their project.

Homework: Ten homework assignments as part of the lab section will be given throughout the semester. Maximum average grade of labs will be no more than 100%.

Teamwork: Teamwork is encouraged to stimulate scientific discussion in lecture and lab. Teamwork is allowed in the lab and for the signature project.

Attendance: Attendance is required and may be taken occasionally. Lack of attendance may influence the final grade.
Student Learning Outcomes:
After completion of this class, students will be familiar with the key terminology pertaining to weather and climate and will have a well-rounded understanding of the major weather events (e.g. hurricanes) as well as complex interactions of the atmosphere with the various components of the climate system, for example ocean and land. Students will be able to:

- Identify methods suitable to weather and climate monitoring (remote sensing, radar, groundbase monitoring).
- Explain the theory of thermal structure of the atmosphere and of radiative transfer.
- Summarize the major physical properties of the atmosphere like pressure, humidity, and saturations.
- Understand the feedbacks between atmospheric processes and processes in other components of the Earth’s climate system (hydrosphere, terrestrial biosphere, cryosphere, and geosphere).
- Analyze the atmospheric circulation system (polar, westerly, and trade winds).
- Describe the principles involved in the development of frontal systems, supercell storms, and tornadoes.
- Evaluate the development of a tropical storm (hurricane) and its threat to the southeast U.S. coast.
- Explain the cause and impact of large-scale climate variations like El Niño.
- Understand weather and climate forecasting, and data assimilation techniques.
- Identify major factors leading to climate change and assess future climate projections.
- Discuss the societal relevance of weather and climate change for global initiatives and political decisions.

This knowledge will enable the students to better understand topics of great societal importance, such as extreme weather events and future climate change, pollution, and environmental sustainability.

Critical Thinking Skills: Critical thinking skills in the area of atmospheric sciences will be trained through weather forecast and experimental meteorology in the classroom, a fieldtrip to the National Weather Service, and through discussions and exercises in lecture and labs. The assessment of the critical thinking skills in atmospheric sciences will be done by a key (signature) assignment that is related to climate change. The goal is to learn and understand key processes in atmospheric science and feedbacks of the climate system in response to natural and anthropogenic perturbations.

Communication Skills: Communications skills will be assessed through scientific discussions in lecture, laboratory, and field. An oral presentation as part of the signature project will be used to assess the communication skills.

Teamwork: Teamwork will be promoted in lecture and lab through discussion and review of the lecture material and through empirical and quantitative laboratory exercises. The teamwork skills will be assessed by the signature project.

Empirical and Quantitative Skills: Quantitative skills are trained in lecture and labs with analysis of the current weather situation and short-term prediction. The assessment of the quantitative skills is performed through classical problem solving (e.g. stability and humidity calculations) and through on-line forecast tools to assess weather and climate change.

Students will be guided to design experiments (e.g. radar case studies) and compare quantitative estimates in the signature project with observations.
Expectations for Out-of-Class Study:
A general rule of thumb is this: for every credit hour earned, a student should spend 3 hours per week working outside of class. Hence, a 3-credit course might have a minimum expectation of 9 hours of reading, study, homework, etc.

Grade Grievances:
Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current University Catalog: http://catalog.uta.edu/academicregulations/grades/#undergraduatetext for graduate courses, see http://catalog.uta.edu/academicregulations/grades/#graduatetext.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (http://wweb.uta.edu/aaofao/).

Disability Accommodations:
UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act* (ADA), *The Americans with Disabilities Amendments Act* (ADAAA), and *Section 504 of the Rehabilitation Act*. All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a letter certified by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

**The Office for Students with Disabilities, (OSD)** www.uta.edu/disability or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

**Counseling and Psychological Services, (CAPS)** www.uta.edu/caps/ or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

Non-Discrimination Policy:
The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos.
Title IX Policy:
The University of Texas at Arlington (“University”) is committed to maintaining a learning
and working environment that is free from discrimination based on sex in accordance
with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits
discrimination on the basis of sex in educational programs or activities; Title VII of the
Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and
the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of
sex discrimination and will not be tolerated. For information regarding Title IX,
visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX
Coordinator at (817) 272-7091 or jmhood@uta.edu.

Academic Integrity:
Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington
Honor Code:

I pledge, on my honor, to uphold UT Arlington’s tradition of academic
integrity, a tradition that values hard work and honest effort in the pursuit of
academic excellence.

I promise that I will submit only work that I personally create or contribute to
group collaborations, and I will appropriately reference any work from other
sources. I will follow the highest standards of integrity and uphold the spirit of
the Honor Code.

UT Arlington faculty members may employ the Honor Code in their courses by having
students acknowledge the honor code as part of an examination or requiring students to
incorporate the honor code into any work submitted. Per UT System Regents’ Rule
50101, §2.2, suspected violations of university’s standards for academic integrity
(including the Honor Code) will be referred to the Office of Student Conduct. Violators
will be disciplined in accordance with University policy, which may result in the student’s
suspension or expulsion from the University. Additional information is available
at https://www.uta.edu/conduct/.

Lab Safety Training:
Students registered for this course must complete all required lab safety training prior to
entering the lab and undertaking any activities. Once completed, Lab Safety Training is
valid for the remainder of the same academic year (i.e., Fall through Summer II) and
must be completed anew in subsequent years. There are no exceptions to this
University policy. Failure to complete the required training will preclude participation in
any lab activities, including those for which a grade is assigned.

Electronic Communication:
UT Arlington has adopted MavMail as its official means to communicate with students
about important deadlines and events, as well as to transact university-related business
regarding financial aid, tuition, grades, graduation, etc. All students are assigned a
MavMail account and are responsible for checking the inbox regularly. There is no
additional charge to students for using this account, which remains active even after
graduation. Information about activating and using MavMail is available
Campus Carry:
Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit http://www.uta.edu/news/info/campus-carry/

Student Feedback Survey:
At the end of each term, students enrolled in face-to-face and online classes categorized as “lecture,” “seminar,” or “laboratory” are directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback via the SFS database is aggregated with that of other students enrolled in the course. Students’ anonymity will be protected to the extent that the law allows. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit http://www.uta.edu/sfs.

Final Review Week:
The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week unless specified in the class syllabus. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures:
Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit by following the exit signs. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Students should also be encouraged to subscribe to the MavAlert system that will send information in case of an emergency to their cell phones or email accounts. Anyone can subscribe at https://mavalert.uta.edu/ or https://mavalert.uta.edu/register.php.

Student Support Services:
UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at http://www.uta.edu/universitycollege/resources/index.php.
The IDEAS Center (2nd Floor of Central Library) offers free tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor email IDEAS@uta.edu or call (817) 272-6593.

The English Writing Center (411LIBR): The Writing Center Offers free tutoring in 20-, 40-, or 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Our hours are 9 am to 8 pm Mon.-Thurs., 9 am-3 pm Fri. and Noon-6 pm Sat. and Sun. Register and make appointments online at http://uta.mywconline.com. Classroom Visits, workshops, and specialized services for graduate students are also available. Please see www.uta.edu/owl for detailed information on all our programs and services.

The Library’s 2nd floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library’s hours of operation. http://library.uta.edu/academic-plaza

<table>
<thead>
<tr>
<th>Emergency Phone Numbers:</th>
<th>In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911. Non-emergency number 817-272-3381</th>
</tr>
</thead>
</table>

Library Home Page library.uta.edu  
Librarian to Contact: Andy Herzog,  
Ph.: 817-272-7517, Email: amherzog@uta.edu, Office: Central Library, 516B

Resources for Students

Academic Help  
Academic Plaza Consultation Services library.uta.edu/academic-plaza  
Ask Us ask.uta.edu/  
Library Tutorials library.uta.edu/how-to  
Subject and Course Research Guides libguides.uta.edu  
Subject Librarians library.uta.edu/subject-librarians

Resources  
A to Z List of Library Databases libguides.uta.edu/az.php  
Course Reserves pulse.uta.edu/vwebv/enterCourseReserve.do  
FabLab fablab.uta.edu/  
Special Collections library.uta.edu/special-collections  
Study Room Reservations openroom.uta.edu/

Teaching & Learning Services for Faculty  
Copyright Consultation library-sc@listserv.uta.edu  
Course Research Guide Development, Andy Herzog amherzog@uta.edu or your subject librarian  
Data Visualization Instruction, Peace Ossom-Williamson peace@uta.edu  
Digital Humanities Instruction, Rafia Mirza rafia@uta.edu  
Graduate Student Research Skills Instruction, Andy Herzog amherzog@uta.edu or your subject librarian  
Project or Problem-Based Instruction, Gretchen Trkay gtrkay@uta.edu
Undergraduate Research Skills Instruction, Gretchen Trkay gtrkay@uta.edu or your subject librarian.