GEOL 4405/5405 METEOROLOGY AND CLIMATOLOGY (3-3)
Syllabus Spring 2016

White Christmas in North Texas 2012 and Hurricane Sandy 2012

Instructor: Arne Winguth, Associate Professor
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Office Hours: Tuesday & Thursday 13:30 -14:00 or with appointment

Teaching Assistant: Nguyen Cao
Email Address: ncao@mavs.uta.edu
Office Hours: Tuesday & Thursday 13:30 -14:00 or with appointment

Section Information:
Lecture GEOL 4405/5405 -001
Lab GEOL 4405/5405 -011

Time and Place of Class Meetings:
Lecture: Tuesday & Thursday 9:30 – 10:50 Geosciences Room 109
Lab: Tuesday, 11:00 – 11:50, Geosciences Room 246

Description of Course Content: A quantitative approach to the study of the structure, energy, and motions of the atmosphere

Student Learning Outcomes: After completion of this class, students will be familiar with the key terminology pertaining to the atmosphere and will have a well-rounded understanding of the major atmospheric processes of the atmosphere including thermodynamics, radiative transfer, atmospheric chemistry, cloud physics, dynamics, weather and climate prediction as boundary layer processes and urban heat island. This knowledge will enable them to have a fundamental knowledge in scientific problems and a better understanding of great societal important topics, such as severe weather, hurricanes, future climate change, meso to large-scale pollution, and environmental sustainability.
Required Textbooks and Other Course Materials: Required Textbooks:

Descriptions of major assignments and examinations: Major course requirements are weekly homework assignments in which students present the results, examinations, and quizzes.

Attendance: Attendance at class meetings is required. Lecture tool quizzes during the lecture and lab count towards the final grades.

Grading and Grade Calculation:
Total Grade: Lecture Portion: 75% of course + Lab Portion: 25% of course

Grading: Lab Portion: 25% of course
Lecture Portion: 75% of course

Lecture Portion:
Lecture tool quizzes 5% of course
Quizzes (3) 10% of course (3.33% each)
Exams(2) 30% of course (15% each)
Final Exam 30% of course

Final grade calculation:
0.25 x lab + 0.15 x quizzes + 0.30 x exams + 0.30 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.
Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels; see “Student Support Services,” below.

Exams:
Exams will be mostly multiple-choice questions, but the final exam will also contain essay questions. No early exams are permitted. Exams must be taken at the scheduled time. Make-up exams can only be taken in cases of illness or family emergency. A valid note from the university disciplinary officer or doctor is 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 out of 4 quizzes will be counted towards the total grade. There are no make-up quizzes. Lecture Tool quizzes are taken on-line in class.
Lab exercises:
Ten weekly lab assignments as part of the lab section will be given throughout the semester. Maximum average grade of labs will be no more than 100%. Identical copy of exercises from web or other sources (plagiarized papers) will result in an F.

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, etc.

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/).

Americans with Disabilities Act: 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). 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. Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671.

Title IX: The University of Texas at Arlington is committed to upholding U.S. Federal Law “Title IX” such that no member of the UT Arlington community shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. For more information, visit www.uta.edu/titleIX.

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 as they see fit in their courses, including (but not limited to) 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.

**Lab Safety Training:**  [Required for laboratory courses in the Colleges of Engineering and Science] 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., through the following August) 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 at [http://www.uta.edu/oit/cs/email/mavmail.php](http://www.uta.edu/oit/cs/email/mavmail.php).

**Student Feedback Survey:** At the end of each term, students enrolled in classes categorized as “lecture,” “seminar,” or “laboratory” shall be 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 enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit [http://www.uta.edu/sfs](http://www.uta.edu/sfs).

**Final Review Week:** A period of five class days prior to the first day of final examinations in the long sessions shall be designated as 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. 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.


**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 www.uta.edu/resources.

**The English Writing Center (411LIBR):** Hours are 9 am to 8 pm Mondays-Thursdays, 9 am to 3 pm Fridays and Noon to 5 pm Saturdays and Sundays. Walk In Quick Hits sessions during all open hours Mon-Thurs. Register and make appointments online at http://uta.mywconline.com. Classroom visits, workshops, and advanced services for graduate students and faculty are also available. Please see www.uta.edu/owl for detailed information.

**Emergency Phone Numbers** 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.

For non-emergencies, contact the UTA PD at 817-272-3381

**Librarian to Contact:** Antoinette Nelson (nelsona@uta.edu)

Other important library information
- Library Home Page.......................... http://www.uta.edu/library
- Subject Guides........................................ http://libguides.uta.edu
- Subject Librarians ................................. http://www.uta.edu/library/help/subject-librarians.php
- Database List .......................... http://www.uta.edu/library/databases/index.php
- Course Reserves .......................... http://pulse.uta.edu/vwebv/enterCourseReserve.do
- Connecting from Off-Campus............... http://libguides.uta.edu/offcampus
- Ask A Librarian................................. http://ask.uta.edu
Course Schedule

“As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course.” – Arne M.E. Winguth

<table>
<thead>
<tr>
<th>Week</th>
<th>Days</th>
<th>Topics and Readings</th>
<th>Reading Chapter</th>
<th>Lab Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan. 19, 21</td>
<td>Introduction</td>
<td>1</td>
<td>Introduction Jan. 19</td>
</tr>
<tr>
<td>2</td>
<td>Jan. 26, 28</td>
<td>The Earth System</td>
<td>2</td>
<td>#1 Earth System Jan. 26</td>
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<tr>
<td>3</td>
<td>Feb. 9, 11</td>
<td>Atmospheric Thermodynamics</td>
<td>3</td>
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<tr>
<td>4</td>
<td>Feb. 16, 18</td>
<td>Radiative Transfer</td>
<td>4</td>
<td>#2 Thermodynamics Feb. 16</td>
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<tr>
<td>5</td>
<td>Feb. 23, 25</td>
<td>Atmospheric Chemistry</td>
<td>5</td>
<td>#3 Radiative Transfer Feb. 23</td>
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<td>1. Exam</td>
<td>Mar. 1</td>
<td>Chapter 1-4</td>
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<tr>
<td>6</td>
<td>Mar. 3, 8</td>
<td>Cloud Microphysics</td>
<td>6</td>
<td>#4 Atmospheric Chemistry Feb. 3</td>
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<tr>
<td></td>
<td>Mar. 14-18</td>
<td>SPRING RECESSION</td>
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<tr>
<td>7</td>
<td>Mar. 10, 22</td>
<td>Atmospheric Dynamics</td>
<td>7</td>
<td>#5 Cloud Lab Mar. 10</td>
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<tr>
<td>8</td>
<td>Mar. 24, 29</td>
<td>Weather Systems I</td>
<td>8</td>
<td>#6 Atm. Dynamics Mar. 24</td>
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<tr>
<td>9</td>
<td>Mar. 31, Apr. 7</td>
<td>Weather Systems II</td>
<td>8</td>
<td>#7 Weather Lab I Mar. 31</td>
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<td>2. Exam</td>
<td>Apr. 5</td>
<td>Chapter 5-7</td>
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<td>10</td>
<td>Apr. 12, 14</td>
<td>Atmospheric Boundary Layer</td>
<td>9</td>
<td>#8 Weather Lab II Apr. 12</td>
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<td>Apr. 19, 21</td>
<td>Climate Dynamics</td>
<td>10</td>
<td>#9 Boundary Layer Apr. 19</td>
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<td>12</td>
<td>Apr. 26, 28</td>
<td>Climate Change</td>
<td>2,10 2)</td>
<td>#10 Climate Lab Apr. 26</td>
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<tr>
<td>13</td>
<td>May 3, 5</td>
<td>Review</td>
<td>1-10 2)</td>
<td></td>
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<td>FINAL</td>
<td>Thurs. May 12 8:00 am -10:30 pm</td>
<td>Chapter 1 to 10 + material covered in class</td>
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<td></td>
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1) Note Text: “Atmospheric Science”.
2) Web: IPCC 2013, [http://www.uta.edu/blackboard](http://www.uta.edu/blackboard)