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**UNIVERSITY OF TEXAS AT ARLINGTON**

**COLLEGE OF ENGINEERING**

**DEPARTMENT OF CIVIL ENGINEERING**

Arlington, Texas 76019

**CE 5300: Hydrometeorology and Remote Sensing**

Fall 2017

**Instructor:** Yu Zhang, Associate Professor

**Office Location:** Room 427, Engineering Research Building

**Office Telephone Number:** 817-272-1874

**Email Address:** yu.zhang@uta.edu

**Faculty Profile: Under construction**

**Office Hours:** 10:00 am – 11:30 am, Mon & Wed, and by appointment

**TA:** TBD

**TA Office Hours/Location:** TBD

**Section Information:** 004, 104 (Combined into 001 on Blackboard)

**Time and Place of Class Meetings:** 4:00-5:20pm, Mon & Wed, 402, Woolf Hall

**Description of Course Content:** CE5300 - Hydrometeorology and Remote Sensing (3 - 0)Atmospheric composition, radiative fluxes, thermodynamics, water vapor, stability, circulation, precipitation processes, fronts, thunderstorms and tropical storms; basics of remote sensing; observing precipitation using weather radar and satellite-borne sensors; prediction of precipitation by numerical weather models. The class will be a combination of lectures and in-class computer-based laboratory exercises.

. Prerequisite: CE 3309 and CE 4328, or equivalent

**Student Learning Outcomes:** Upon completion of this course, students should be able to:

* Understand basic principles governing the atmospheric circulation and precipitation process
* Explain processes underlying initiation and propagation of storm and interpret basic weather maps
* Understand basic mechanisms of active and passive remote sensing
* Utilize tools for displaying radar and satellite images and interpret precipitation features
* Gather, process, and display numerical weather model forecasts

**Required Textbook**

**Stull, R., 2011: "Meteorology for Scientists & Engineers, 3rd Edition." Univ. of British Columbia. 938**

**pages. isbn 978-0-88865-178-5**

**Recommended Course Materials:**

Janssen L L. F and coauthors: “Principle of Remote Sensing - An introduction textbook” 410 pages, ISBN 90–6164–199–3

# Fabry F., 2015: “Radar Meteorology, Principles and Practice, 1st Edition”, Cambridge University Press, ISBN 978-1-107-07046-2

Other references will be added as necessary.

**Descriptions of major assignments and examinations with due dates:** There will be a mid-term exam and the final exam. Students will be required to complete a term project.

**Attendance:** Attendance for all class sessions is expected but will not be taken.

**Grading**:

90-100% A

80-90% B

70-80% C

60-70% D

<60% F

Course grading structure

Homework 25%

Mid-Term Exam 20%

Project 30%

Final Exam 25%

The instructor reserves the right to adjust the grade distribution, policy and structure. Any concerns about scores on individual assignments, tests or projects must be brought to the attention of the instructor within 5 days from the day that the score was returned to the student. After 5 days, scores are closed to discussion.

**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/aao/fao/>).

**Americans with Disabilities Act:** The University of Texas at 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)*. 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 that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at [www.uta.edu/disability](http://www.uta.edu/disability) or by calling the Office for Students with Disabilities at (817) 272-3364.

**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](http://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.

**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>.

**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>.

**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, which is located toward either end of the hallway. 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**: [Required for all undergraduate courses] 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](http://www.uta.edu/resources).

**Course Schedule**

**(tentative)**

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| --- | --- | --- | --- | --- |
| Week | Dates | Lecture Topic | Laboratory Exercise | Home Work |
| 1 | Aug 28, 30 | Atmospheric composition, radiative fluxes |  |  |
| 2 | Sep 4, 6 | Ideal gas law, water vapor | Unidata IDV | HW1 |
| 3 | Sep.11, 13 | Adiabatic process and lapse rate |  |  |
| 4 | Sep 18, 20 | Buoyancy and stability | Analysis of Sounding data | HW2 |
| 5 | Sep 25, 27 | Buoyancy and stability |  |  |
| 6 | Oct 2,4 | Cloud and precipitation |  |  |
| 7 | Oct 9, 11 | Remote sensing fundamental | Satellite data visualization | HW3 |
| 8 | Oct 16, 18 | Weather radar |  |  |
| 9 | Oct 23, 25 | Midterm/ |  |  |
| 10 | Oct 30, Nov 1 | Radar precip estimation | CASA radar | HW4 |
| 11 | Nov 6, 8 | Circulation |  |  |
| 12 | Nov 13, 15 | Weather maps | Weather maps | HW5 |
| 13 | Nov 20, 22 | Fronts and Thunderstorms |  |  |
| 14 | Nov 27 29 | Tropical cyclones | Tropical cyclone display | HW6 |
| 15 | Dec 4, 8 | Weather and flash flood prediction |  |  |
| 16 | Dec. 11 | Final exam |  |  |

**Emergency Phone Numbers**: [Optional but strongly recommended] 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.