MAE 2381 Section 004

Experimental Methods and Measurements I

Spring 2018

Tuesday and Thursday, 12:30 –1:50 PM

Location: NH 105

1. Instructor:	Kathy Hays-Stang
2. Office Location:	323J Woolf Hall
• **Office Hours:**	**M**W 1 – 3 PM, TTh 10 – 11 AM & 2 – 3 PM, open door policy, or by appointment
4. Phone:	817-272-1308
5. Email:	haysstang@uta.edu
6. Faculty Profile	https://mentis.uta.edu/explore/profile/kathy-hays-stang
7. Lecture GTA	TBA
8. Lecture GTA contact information	BLACKBOARD under Course Materials
9. Class Web Site:	BLACKBOARD https://elearn.uta.edu
Link to Additional Course Info:	open
Course Calendar with Exam, etc Dates	BLACKBOARD under Course Materials
10. Course Prerequisites:	MAE 1351 and MATH 2425

11. Required Reading/Materials:

Textbook:

R.S. Figliola and D.E. Beasley, Theory and Design for Mechanical Measurements, 5th or 6th ed., Wiley, 2011 or 2015 (hard bound) http://www.wiley.com/WileyCDA/WileyTitle/productCd-EHEP001804.html, Errata on Wiley website or omega.uta.edu/~haystang/MAE2381

Information on campus specific version of textbook http://wiley.**adobeconnect**.com/p85jiec6bue/

For future reference, recommend purchase of one paper copy of the textbook:

i. e., one hard bound full version *or* one soft bound campus specific version of the textbook

Course notes: posted on BLACKBOARD

Lab manuals: posted on BLACKBOARD

12. Course Description:

Introduction to data analysis, (basic Fourier analysis, data reduction, statistics and probability), design and planning of engineering experiments for error prediction and control. Measurement and instrumentation, basic instruments, their calibration and use.

13. Course Learning Goals/Objectives:

1. To provide a background in engineering measurements and measurement system performance
2. To convey the principles and practice for the design of measurement systems and measurement test plans, including the role of statistics and uncertainty analyses in design
3. To introduce data analysis, reduction, and reporting of results through formal reports.

14. Attendance Policy:

Attendance is expected for all lectures. Do not be late.

Attendance is mandatory for all labs. Do not be late

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 when withdrawing from or dropping a class. For more information about required repayment of financial aid or scholarship money contact the Office of Financial Aid and Scholarships (http://wweb.uta.edu/ses/fao).

14. Tentative Lecture/Topic Schedule (course content):

- Technical report writing and presentation of data
- Ethics
- Measurement systems and methods
- Signal characteristics and analysis
- Measurement system behavior
- Probability and statistics for measurement systems
- Uncertainty analysis
- Experimental planning and practical measurements

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.

15. Laboratory Procedures, Policies, and Report Requirements are presented first day of lab.

General expectations of students

Knowledge is power: become powerful by absorbing as much knowledge as you can. Take personal responsibility for mastering the material presented in this course.

The instructor and teaching assistants are here to help you understand the course material. If you do not understand something presented in the class or lab, ask questions when they occur to you or seek help outside of class, preferably from the course instructor or GTAs.

A lab course offers the opportunity to observe real engineering material behavior. Any unfamiliar basic modeling equation describing expected observed experimental behavior is an opportunity to learn.

For successful lab course completion, a student should spend more time preparing reports than in the lab.

All work submitted should be work you did yourself, can explain, and can independently do again.

To get an "A", submit all work completed and correctly done on time. Do not lobby for a "bump".

You (or someone else on your behalf) are paying the university to offer you the opportunity to learn about experimental measurements; money paid to this university does not guarantee you credit in any course nor a degree from this university.

Classroom expectations of Students:

- Phones, computers, etc. off. (Handwriting notes improves long term retention of material.)
- Ask a question if you don't understand something. The answer may benefit other students.
- Class attendance is expected
  - Attend every lecture mentally and physically
  - Maintain working understanding of previous lectures to understand current lecture.
  - Arrive on time and stay for the whole period.
  - Mental and Physical Attendance determined by a short quiz at the end of the presentation. You may view only your hand written notes to answer the quiz question.

From http://www.uta.edu/blackboard/students/course-faq.php

Per UT Arlington's Academic Dishonesty Regulation, "All students are expected to pursue their academic careers with honesty and integrity." Faculty members are given the option to make assignments "SafeAssignments" which are indicated by the green checkmark icon. SafeAssign is an anti-plagiarism tool that compares your work against any other works found on the Internet and in the student work database. Submitting an assignment to SafeAssign enters it into the SafeAssign database for comparison with assignments submitted by anyone at UT Arlington in the future.* For personal protection of your work, you are also given the option to include your submission not only to UT Arlington's SafeAssign database, but to the global SafeAssign database used by any others subscribed to SafeAssign.

***Note: SafeAssign also checks against copies of assignments from previous semesters.**
SafeAssign will be used in this course when evaluating lab reports.

Specific Course Requirements with descriptions

1. **Quizzes** (number and type): about fifteen - 10 minutes, over lecture or homework
2. **Examinations** (number and type):
   - One midterm (lecture materials, first half of semester)
   - One final (lecture materials, second half of semester, general questions over lab activities)
   - Both examinations are multiple choice, answer sheet (scantron) will be provided.
3. **Homework:** 5-6 assignments. For credit, lecture homework must be in required format. Submitted homework is to be done by individual student. *A short quiz* similar to a homework problem will be given on the due date at the beginning of class. *Fail "homework" quizzes* → Appointment(s) with GTA or instructor, and possibly zero credit for assignment(s).
4. **Labs:** seven labs with formal lab reports. Lab reports to be prepared by individual students who do the labs with 2 or 3 other students. Lab sections meet in **319 WH**. **Do not be late**.
5. **Missed Exams, Quizzes and Makeup Work, and Appeals Policy:**
   - **Inform instructor by email if you will miss a lab or exam. Please present proof of illness or other significant event preventing you from taking the exam/doing the lab during the scheduled time. Exams must be made up <u>immediately</u> and are subject to tardiness policy of 10%, or after one week, a grade of 0.**
   - **Lab policies will be discussed in your lab section safety briefing.**
   - **No late/missed homework will be accepted.**
   - **<u>Appeals – one week given for grade appeals after an assignment is handed back.</u>**
6. **Key Assignments** This course is specifically designed to develop your ability to work independently, to present the results of experimental investigations in published paper form, to promote ethical behavior, to observe physical phenomena predicted by mathematical models, and to understand the basics of designing an experiment. Certain course assignments designated as "key" assignments assess these outcomes and must be satisfactorily completed
   - Three Key Assignments: Ethics quiz (violation 0), Homework 2, and LabVIEW lab (Lab 7).
   - Students who do not pass two out of the three key assignments may have to repeat class even if their cumulative average indicates a passing grade.
7. **Grading Format Weighting / Point Value of Assignments and Examinations:**

In class lecture quizzes 5%	Labs 35%
5-6 HW assignments 20%	Midterm Exam 20%
	Final Exam 20%

8. **Grade Scale:** A 90-100, B 80-90, C 70-80, D 60-70, F less than 60

STANDARD UNIVERSITY POLICIES

Academic Integrity: Students enrolled in this course 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.*

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., 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.

For MAE 2381, the lab safety training is conducted during the first lab meeting.
If you are absent from this meeting, you must make up the training or you will be dropped from the course.

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.

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 or by calling the Office for Students with Disabilities at (817) 272-3364.

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.

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.

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.

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 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. 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 handicapped individuals.