MAE 2381 Section 001 Experimental Methods and Measurements I Fall 2017 Monday and Wednesday, 10:00 – 10:50 AM

Monday and Wednesday, 10:00 – 10:50 AM Location: GACB 105

1. Instructor:	Kathy Hays-Stang
2. Office Location:	323J Woolf Hall
3. Office Hours:	MTWTh 1 to 3 PM, open door policy, or by appointment
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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	TBA
9. Class Web Site:	BLACKBOARD <u>https://elearn.uta.edu</u>
Link to Additional Course Info:	open
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) <u>http://www.wiley.com/WileyCDA/WileyTitle/productCd-</u> EHEP001804.html, Errata on Wiley website or omega.uta.edu/~haystang/MAE2381

Information on campus specific version of textbook <u>http://wiley.adobeconnect.com/p85jiec6bue/</u> 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 behaviors of materials. Any unfamiliar basic modeling equation or observed behavior in an experiment 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 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.)
 Material found on YouTube or another website may or may not be correct.
 - 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 <u>http://www.uta.edu/blackboard/students/course-faq.php</u>

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): 5-10 minutes, as needed over lecture or homework
- 2. **Examinations** (number and type):
 - One midterm (coverage first half of semester)
 - One final (coverage 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* \rightarrow Appointment(s) with GTA or instructor, and possibly get no 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. Missed labs and exams must be made up <u>immediately</u> and are subject to tardiness policy exams: 10% for up to a one week delay and then a grade of 0, missing a lab with no prior notice to the GTA: see safety briefing.
 - Grades on lab reports handed in late: see 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 (three total, students expected to pass at least two)
 - Professional Ethics: View presentation followed by *quiz*. No pass for actual ethics violation.
 - Design and Conduct Experiments: Create LabVIEW virtual instrument thermometer with a thermocouple, calculate instrument time constant, and describe instrument behavior in *report*.
 - Techniques, Skills and Tools: Submit *homework* plots of digital and continuous "signals" as functions of time and frequency with associated hand and computer Fourier analysis work.
- 7. Grading Format Weighting / Point Value of Assignments and Examinations:
 - In class lecture quizzes 5%
 - 5-6 HW assignments 20%
 - Labs 35%
 - Midterm 20%
 - Final 20%
- 8. **Grade Scale:** A 90-100, B 80-90, C 70-80, D 60-70, F less than 60