Course Number: MEEN 2146
Title: ENGINEERING MEASUREMENTS
Credit Hours: 1 (3 hours lab)

Instructor: Joseph Rendall
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Catalog Description:

MEEN 2146: Engineering Measurements
Basic experimental techniques and instrumentation commonly found in industry. Experimental planning and analysis. ASTM methods introduced. Data acquisition means studied. Significance of data presentation (written and oral). Computer usage and report writing emphasized. Prerequisites: MATH 2414, PHYS 2326/2126, MEEN 1320 or CSEN 2304 and CEEN 2301.

Text Book:

References:

Computer Usage:
Students use computers in this class for homework assignments and projects

Grading Policy, Exams, Homework, etc.:
• Reports (40%)
  • Chance to repeat 1 lab to replace a grade
• Project (20%)
• Presentation (10%)
• Homework (10%)
• Mid Term Exam (10%)
• Lab notebook (5%)
• Reading/Video Quiz (5%)

Guidelines:
Lab activities will cover basic training in software and hardware, practical issues on data acquisition, interfacing, simulations and experimental validations. Experiments are to be announced. Experiments will be assigned and students will be working on them throughout the semester.

Course Content:
• Basic Concepts of Measurement Methods.
• Static and Dynamic Characteristics of Signals.
• Measurement System Behavior.
• Fourier Analysis
• Probability and Statistics.
Mission Statement:
The mission of the faculty of the Engineering Measurements class is to help students acquire analytical, computational, and experimental knowledge for measurements of engineering systems.

Course Objectives:
The objectives of the Engineering Measurements class are to help students learn how to:

1. Apply the fundamental principles of measurements, error analysis, instrumentation methodology, and experimental design to the solution of practical problems related to experimental measurement and data analysis.
2. Demonstrate a working knowledge of the theoretical basis for operation of instruments, sensors, and associated equipment by analyzing practical problems dealing with the use of such instruments, sensors, and equipment.
3. Demonstrate familiarity with the operation of various instruments by hands-on application in the laboratory.
4. Effectively communicate the design and results of experimentation through engineering report writing.
5. Demonstrate understanding with ethical issues in academics and profession.

Course Outcomes:
At the completion of this Engineering Measurements class, students should gain:

a. Ability to apply knowledge of basic mathematics, science, and engineering in solving engineering problems
   1. applying theoretical principles of sensors and actuators for measurements;
   2. using operational principles of sensors and actuators for measurements;
   3. performing necessary calculations for determining parameters/variables of interest of a particular experiment;
   4. manipulating and calculating important parameters for experiment;
   5. understanding the basic elements of a measurement system, uncertainty analysis;

b. Ability to design and conduct experiments, as well as to analyze critically and interpret data
   6. designing a particular measurement experiment;
   7. measuring physical variables with instruments;
   8. understanding data acquisition and collecting data by automated means;
   9. conducting numerical simulations of experiments;

c. Ability to use modern tools, techniques, and computation methods necessary for engineering practice
   10. Use of computers, data acquisition devices/tools and related software;

d. Ability to apply probability and statistics in engineering
   11. Use of probability and statistics principle when analyzing data and performing uncertainty analysis.

Disability statement (See pages 2 & 11 of Student Handbook):
Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In
accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

**Academic misconduct (See page 23, section 100 of Student Handbook):**
You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

**Forms of academic dishonesty:**
1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.
2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.
3. Fabrication: use of invented information or falsified research.
4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else’s words, ideas, or data as one’s own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one’s own work also constitutes plagiarism.

**Nonacademic misconduct (See page 23, section 100 of the Student Handbook):**
The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor’s ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

**Sexual misconduct (See page 23, section 200 of Student Handbook):**
Sexual harassment of students and employers at Texas A&M University-Kingsville is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.