

EML 3523C - EXPERIMENTAL METHODOLOGY
Common Course Syllabus

Catalog Data: 3 Credits, Study of typical measuring systems. Solutions of engineering problems by experimental means, to include analysis of experimental data. Two hours lecture, 3 hours lab.

Goals:

1. To provide a fundamental background for the design of measurement systems.
2. To establish the fundamental principles and provide the prevailing engineering practice for the measurement of important physical variables in engineering applications.

Prerequisites:

1. Electro-Mechanical Devices – EGM 4045 (with a minimum grade of C)

Pre/Corequisites:

1. Dynamics – EGN 3321 or equivalent
2. Fluid Mechanics – EML 3701
3. Probability and Statistics for Engineers – STA 4032

Topics:

1. Basic Concepts of Measurement Methods (2 classes)
2. Static & Dynamic characteristics of Signals (3 classes)
3. Analysis of Experimental Data (2 classes as needed)
4. Uncertainty analysis (3 classes)
5. Analog Electrical Devices & Measurements (4 classes)
6. Sampling, Digital Devices and Data Acquisition (4 classes)
7. Temperature Measurements (3 classes)
8. Pressure and Velocity Measurements (4 classes)
9. Flow Measurements (3 classes)
10. Strain Measurements (2 classes)
11. Minimum of four laboratory sessions with formal reports
12. Minimum of three laboratory sessions with data analysis

Course Outcomes: (numbers in parentheses indicate correlation of the outcome with the appropriate ABET program outcomes 1-7)

1. The student will understand how to select the proper technique and instrumentation for a measurement system. (6)
2. The student will be able to select the proper way to perform data acquisition and data processing. (6)
3. The student will be familiar with various types of sensors/transducers used in mechanical measurements. (1)
4. The student will be able to describe in writing the methods and procedures followed in obtaining the experimental results and present the final results. (3)

Design Content:

This course has no requirement for design content.

Laboratory Content:

1. Technical Writing.
2. Automated Data Acquisition and Data Processing.

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