

ME 301: Engineering Instrumentation Laboratory

Type (check one): Required: ✓ Elective:

2005-2006 Catalog Data: ME 301. Engineering Instrumentation Laboratory. A laboratory course designed to instruct the student in the theory and use of various engineering instruments and transducers. Emphasis is placed on appropriate error analysis in the reduction, analysis, and reporting of data. Technical report preparation is emphasized. Two lecture periods and one laboratory period of three hours. (Same as ECE 201)
Prerequisite: ECE 221. Offered in the Fall semester. *One semester; two credits*

Prerequisites: ECE 221

Co-Requisites: None

Textbook: A. J. Wheeler, A. R. Ganji, *Introduction to Engineering Experimentation*, Second Edition, Pearson-Prentice Hall, 2004.

Other Required Materials: None

Other References: None

Instructor: Dr. Joseph M. Londino, Assistant Professor of Mechanical Engineering

Course Objectives: 1. Provide a hands-on introduction to instrumentation used in engineering
2. Develop skills in analysis and presentation of experimental data
3. Develop ability to design and to execute engineering experiments

Prerequisites by Topics: 1. Differential and integral calculus

Topics: 1. Statistical Analysis of Experimental Data
2. Correlation of Experimental Data
3. DC measurements and data collection
4. Waveform measurements of a rectified sinusoid
5. Fast Fourier Transform techniques
6. Pressure Measurement
7. Temperature measurement using a thermocouple
8. Stress measurement using strain gages

Class Schedule: Two 50-minute class sessions plus a 3-hour lab each week

Prepared by: Dr. Joseph M. Londino **Date:** August 2005

**Professional Component:
ME 301 – Engineering Instrumentation Laboratory**

Category (check one)	<input type="checkbox"/> Math/Basic Science <input checked="" type="checkbox"/> Engineering <input type="checkbox"/> General Education <input type="checkbox"/> Other
Design (check one)	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Some <input type="checkbox"/> None
Realistic Constraints (check all that apply)	<input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input type="checkbox"/> Sustainability <input checked="" type="checkbox"/> Manufacturability <input type="checkbox"/> Ethical <input checked="" type="checkbox"/> Health & Safety <input type="checkbox"/> Social <input type="checkbox"/> Political

Relationship to Program Outcomes:

Check all that apply:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs
- (d) an ability to function on multi-disciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
- (i) a recognition of the need for and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice