

**MIAMI UNIVERSITY  
SCHOOL OF ENGINEERING AND APPLIED SCIENCE  
DEPARTMENT OF ENGINEERING TECHNOLOGY**

ENT 404	Experimentation Techniques for Engineering Technology	3
Course Number	Title	Credit Hours

**DESCRIPTION:**

This course provides coverage of experimentation techniques pertaining to engineering instrumentation and performance testing. This course will make use of laboratory experiments practical applications, problem based learning and case studies.

**PREREQUISITES:**

MTH 251 : Calculus-II

**TEXT MATERIAL:**

Beckwith, Thomas G., Marangoni, Roy D., and Lienhard V, John H. Mechanical Measurements 6<sup>th</sup> Edition Reading, MA: Addison-Wesley, 2007.

**COURSE OBJECTIVES:**

Upon completion of this course, the student should be able to:

- Plan and document experimental data.
- Understand the general characteristics of measurements
- Understand and specify mechanical measurements associates with temperature, pressure, strain, etc.
- Observe the dynamic behavior of measurement systems.

**COURSE OUTCOMES:**

1. An Understanding of Mechanical Measurement Techniques.
2. An Understanding of Thermal Measurement Techniques.
3. An Understanding of Stress Measurement Techniques.
4. An Understanding of Fluid Measurement Techniques.

**(TENATIVE) TOPICAL OUTLINE:**

Week	Subject	Chapter	Problems	Labs
1	Introduction and Course Planning			
2	Fundamentals of Mechanical Measurement	1	2	1
3	Standards & Dimensional Units of Measurement	2	5,7	2
4	Displacement & Dimensional Measurement	11	6	3
5	Strain & Stress: Measurement & Analysis	12	8, 15, 30	4
6	Measurement of Force & Torque	13	6, 7, 10	5
7	Practical Applications / Case Studies			
8	Midterm			
9	Measurement of Fluid Pressure	14	25, 27	6
10	Measurement of Fluid Flow	15	5, 29, 33	
11	Temperature Measurements	16	12, 16, 21, 39, 40, 41	7
12	Problem Based Learning			8
13	Measurement of Motion	17	4, 5	9
14	Practical Application			
15	Summary and Applications			
16	Final Exam			

## **METHOD OF EVALUATION:**

The student will be evaluated on homework problems, written laboratory reports a portfolio of your work., tests, and a final examination.

Portfolio and Homework	30%
Labs	30%
Tests	20%
Final exam	20%

## **ETHICS AND ACADEMIC CONDUCT**

It is expected that all members of the Department of Engineering Technology (faculty, staff and students) will adhere to the highest ethical standards in all matters. The Department endorses the Code of Ethics for Engineers proposed by the National Society of Professional Engineers and strongly defends the rights and responsibilities that accompany academic freedom which are at the heart of the intellectual integrity of Miami University.

It is expected that students will actively conduct themselves in an ethical fashion, for example, by only possessing and using materials authorized by the instructor during examinations, submitting assignments which are the student's original work (carefully referencing sources of information), protecting the integrity of assignments by adhering to prescribed procedures, and carefully utilizing the University's educational resources of materials and equipment.

Any activity that tends to compromise the academic integrity of the institution or subvert the educational process is defined as academic misconduct. Cheating and other forms of academic misconduct undermine the value of a Miami education for everyone, especially for the person who cheats.

The ENT department regards the adhering to academic ethical standards as a very serious issue and will follow the procedures and penalties for academic misconduct (dishonesty) as prescribed in Part V of The Student Handbook, pp. 10-12.

## **MIAMI UNIVERSITY LEARNING COMMUNITY**

Miami University is committed to fostering a supportive learning environment for all students irrespective of individual differences in gender, race, national origin, religion, handicapping condition, sexual preference, or age. Students should expect, and help create, a learning environment free from all forms of prejudice. Disparaging comments, sexist or racist humor, or questioning the academic commitment of students based upon these individual differences are behaviors that undermine our learning community. If such behaviors occur in class, please seek the assistance of your instructor or department chair.

## **UNIVERSITY STATEMENT ASSERTING RESPECT FOR HUMAN DIVERSITY**

Miami University is a multicultural community of diverse racial, ethnic, and class backgrounds, national origins, religious and political beliefs, physical abilities, ages, genders, and sexual orientations. Our educational activities and everyday interactions are enriched by our acceptance of one another; and, as members of the University community, we strive to learn from each other in an atmosphere of positive engagement and mutual respect.

Because of the necessity to maintain this atmosphere, bigotry will not go unchallenged within this community. We will strive to educate each other on the existence and effects of racism, sexism, ageism, homophobia, religious intolerance, and other forms of invidious prejudice. When such prejudice results in physical or psychological abuse, harassment, intimidation, or violence against persons or property, we will not tolerate such behavior nor will we accept jest, ignorance, or substance abuse as an excuse, reason, or rationale for it.

All who work, live, study, and teach in the Miami community should be committed to these principles which are an integral part of Miami's focus, goals, and mission