

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

<b>ENT 407</b>	<b>MODERN MANUFACTURING SYSTEMS</b>	<b>3</b>
Course Number	Title	Credit hours

**DESCRIPTION:** Coverage of topics related to the manufacturing processes, advanced topics in strength of materials, and manufacturing automation. Credit Hours: 2 Lecture Hours, and 2 Laboratory Hours.

**PREREQUISITES:**  
ENT 151, ENT 272, ENT 296

**TEXT MATERIAL (References):**

Machine Elements in Mechanical Design, by Robert L. Mott, 4<sup>th</sup> Ed, ISBN 0-13-061885-3, © 2004.  
Manufacturing, by Beno Benhabib, ISBN 0-8247-4273-7, © 2003.  
Computer-Integrated Manufacturing, Rehg & Kraebber, 3<sup>rd</sup> Ed, ISBN 0-13-113413-2, © 2005.

**COURSE OBJECTIVE:**

Upon Completion of this course, students will be able to:

1. Use statics, dynamics, and manufacturing processes to aid in the characterization, analysis, and troubleshooting of electromechanical systems.
2. Use advanced topics in engineering mechanics, and engineering materials for applied design, operation, or troubleshooting of electromechanical systems.
3. Apply concepts associated with modern manufacturing systems, including metal deflection and tolerance, robotics, programmable controller applications, and flexible manufacturing.

**COURSE OUTCOMES:**

These objectives help meet the following Electromechanical Engineering Technology outcomes:

- The ability to assemble, interpret, and analyze laboratory experiments.
- The ability to apply creative technical skills for the design and implementation of modern instrumentation and control applications.

**TOPICAL OUTLINE:**

<b>Principles of Design and Stress Analysis:</b>	
Week 1 & 2	Review of stress, strain, and deformation analysis
Week 3 & 4	Design for different types of loading
Week 5	Elastic instability and design of machine members
<b>Manufacturing Processes:</b>	
Week 6	Metal casting
Week 7	Metal forming
Week 8	Machining
Week 9	Joining and Assembly processes
<b>Automatic Control in Manufacturing:</b>	
Week 10 & 11	Auto-Identification
Week 12	Material handling systems
Week 13	Human-machine interfaces
Week 14	Control of production and assembly machines
Week 15	Supervisory control of flexible manufacturing systems

**METHOD OF EVALUATION:**

**Grading Distribution:**

The following is the distribution of credit for the required tasks:

Three Tests	30%
Class Attendance and participation	5%
Class Notebook with homework	20%
Laboratory assignments and projects	25%
Final Examination	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 (<http://www.nspe.org/ethics/eh1-code.asp>) 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.