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

ENT 278	**ANALYSIS OF MACHINE COMPONENTS**	**3**
Course Number	Title	Credit hours

DESCRIPTION: Introduction to the use of statics and strength of materials to the analysis of individual machine components. Application of these principles to overall machine analysis is presented.

PREREQUISITES:
ENT 272

TEXT MATERIAL:
Machine Elements in Mechanical Design, 4TH Edition, by Robert L. Mott

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

1. Apply basic engineering methods and techniques to analyze complex mechanical components and systems
2. Able to function effectively within a team-work environment
3. Use computer-aided design tools for mechanical design and analysis
4. Improve presentation skills and generate a technical design report while working within the confines of a design team.

COURSE OUTCOMES:

Outcome 2 Fundamental knowledge of engineering materials and how these materials are used in the design of machine components and systems
Outcome 3 The ability to apply creative technical skills to the analysis and design of mechanical components and systems
Outcome 9 Written and verbal communication skills necessary for success in the modern industrial environment
Outcome 11 Effective team work skills

TOPICAL OUTILINE:

Week	Chapter	Topics	Lab Activities
1	1	The nature of mechanical design	FEA-based stress analysis tools available on the web
	2	Materials in mechanical design	
	3	Stress and deformation analysis	
2	5	Design for different types of loading	Fatigue failure video
3	5	Design for different types of loading	
4	6	Columns (Quiz 1: CH. 1-5)	Spreadsheet analysis
5	7	Belt drives and chain drives	Web-based belt selection tools
6	8	Kinematics of gears	
7	8	Kinematics of gears	SME Gear-design video Gear design spread sheet Analysis of gears with FEA
8	9	Spur gear design (Quiz 2: CH. 6-8)	
9	Spring Break		
10	11	Keys, couplings, and seals	
11	12	Shaft design	Shaft-design spread sheet
12	14	Rolling contact bearings (Quiz 3: CH. 9-12)	
13-16	15	Design project	Group activities involving the complete design process
17	*Final Exam*		

METHOD OF EVALUATION:

Grading Distribution:

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

Quizzes	30%
Design Project and Reflective Essay	30%
Attendance, Punctual/collegial in group work	5%
Homework Assignments	10%
Final Examination	25%

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.