Syllabus for Engineering 111A – Mechanics Track
Foundations of Engineering I
Credit 2: (1-3)
Spring 2006

Instructors:
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Teaching Assistant:
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Textbooks Required: Introduction to MATLAB 7 for Engineers, by Palm, McGraw-Hill, 2004.
The Engineering Graphics Pack "E".

RECOMMENDED: MATLAB Student Version (Release 14 with MATLAB 7.1), by MATHWORKS, 2005.

Prerequisite(s): Math 151 or registration therein and admission to the College of Engineering

Course Description: Introduction to the engineering profession, ethics, and disciplines; development of skills in teamwork, problem solving and design; major emphasis on computer applications and programming; visualization and CAD tools.

Method of Evaluation:

Homework / In-Class Assignments / Quizzes	25% (~1/5 team)
Exams (2):	35% (No team)
Project (at least 1):	15% (Mostly team)
Comprehensive Exam:	25% (No team)

(The two major exams are not curved. Comprehensive exam may have point value greater than 100, if necessary.)

Team Grades: The **TEAM** must insure that all members of the team contribute to and understand the contents of team submissions. All team members who sign a team quiz or assignment will receive equal credit for that team submission. A grade of zero will be assigned to any member not signing a team submission. Team grades may include team efforts as well as the lowest individual member quiz grade (where the quiz is based on a previous team assignment). The TEAM grade includes a peer evaluation.

Common Event Schedule:

Department Presentations:	Tuesday, March 7, 2006	7:00 – 9:00 PM

Examination Schedule:

Examination #1	Wednesday, February 22, 2006	8:15 – 9:45 PM
Examination #2	Wednesday, April 12, 2006	8:15 – 9:45 PM
Comprehensive Exam (#3)	Thursday, April 27, 2006	8:15 – 9:45 PM

Notice: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that

provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Office of Support Services for Students with Disabilities in Room 126 of the Koldus Building. The phone number is 979-845-1637.

Policies:

Academic Integrity Statement:

"An Aggie does not lie, cheat, or steal or tolerate those who do."

All students should refer to the Honor Council Rules and Procedures: http://www.tamu.edu/aggiehonor

Academic Dishonesty: Collaboration on examinations, in class assignments, and homework assignments is forbidden except where specifically specified as **"Team"** activities. In general, one team may not collaborate with another team on **"Team"** activities. Students violating this policy will be subject to procedures described in Section 20 (Scholastic Dishonesty) of the 2004-2005, Texas A&M University Student Rules.

Attendance:

Unexcused absences: Students who miss class without prior approval of their instructor will receive a grade of zero on the missed in class assignment.
University excuse absences: Authorized absences must be approved by your instructor in advance of the absence, unless you have an emergency or illness. Make-up work must be completed outside of normal class hours within ONE WEEK following an excused absence. IT IS YOUR RESPONSIBILITY to see your teacher and make arrangements for make-up work.

In Class Assignments: All in class assignments must be completed by the end of the class period. It is the discretion of the individual instructor to grant additional time if deemed necessary.

In Class Quizzes: In-class quizzes will include individual and team Readiness Assessment Tests (RATs) and Post Assessment Tests (PATs). RATs normally cover reading assignments and often occur **before** material is covered in class. PATs are short quizzes on material covered in a previous class.

Homework Assignments: Homework assignments must be worked out on engineering paper, workbook plates or submitted as produced by the printer. All homework assignments are due at the beginning of the class on the assigned due date. **NO LATE HOMEWORK WILL BE ACCEPTED, REGARDLESS OF THE REASON.** However you will be allowed to drop your two lowest homework grades. Note, that some assignments may count as a "double" assignment. If a "double" assignment is your lowest grade, you will be allowed to drop it but no other grades.

Examinations: Two major exams and a comprehensive exam will be given during the semester. Exams 1 & 2 will be given at night on February 22 and April 12. The Comprehensive Exam will be given in the evening on April 27. There will be no additional final exam.

Grading Dispute: If you believe there is a mistake in grading, you must ask the corresponding grader for reconsideration ***in writing within a week*** from the moment the graded papers were distributed. After then, no reconsideration request will be honored. You should keep all your work in this course till the end of this semester.

Computer Usage: All ENGR 111 students are allowed open access to the 111 classrooms after normal class hours. Hours for these rooms will be set to accommodate the needs of the students. Consult the ENGR 111 web page for information on available hours for each 111/112 lab. Space is limited considering the number of students enrolled in the course. You are asked to be considerate of others and not waste time in these rooms after hours once you have completed your work. ***Personal usage (web surfing, emailing, instant messaging, gaming, etc.) of these computing facilities is strictly prohibited, especially during the class hours.***

Resource Conservation: Please observe the following paper conservation policies:

- Preview your work and correct errors before printing.
- Return extra clean sheets to the printer.
- Place discarded copies in the recycle bins.
- Print only what you need. Avoid making unnecessary copies.

Learning Objectives (Summary):

1. By the end of the semester students should be able to complete routine programming assignments in MATLAB. This would include: problem analysis, flowcharting, coding, debugging and testing, and display of results in text and graphical formats. Programming would include the basics of: file creation and use, arithmetic and logical expressions, matrix manipulation, logical structures, development of functions, and 2-D and 3-D graphics.
2. Students should be able to work as teams and complete project team assignments with little supervision.
3. Students should learn how to benefit from "active collaborative learning" mode of teaching in a large class environment.
4. Students should demonstrate the ability to do neat work and to be well organized.
5. Students should be able to create orthographic views of objects.
6. Students should be able to sketch objects freehand to communicate concepts.
7. Students should be able to draw isometric and oblique pictorials of objects.
8. Students should be able to visualize objects 3-dimensionally.
9. Students should be able to list and recognize the six major types of sectional views
10. Students should be able to apply dimension and tolerances to orthographic views in accord with ANSI standards and conventional engineering practices
11. Given two toleranced, mating parts, students should be able to determine the type of fit and calculate the basic parameters of: Hole Tolerance, Shaft Tolerance, Allowance, Maximum Clearance.
12. Students should be able to list the 14 geometric tolerance symbols and the name of each one.
13. Students should be able to use a modern Computer Aided Design Program to complete 2 dimensional drawings of objects.

Topic	Description	Hours
1	Introduction to ENGR 111 and the Engineering Profession.	2
2	Programming environment, algebraic expressions and logical operators.	2
3	Scalar, Vector, and Matrix notation, addressing, and formation.	4
4	Data files, Mat files, Diary files, Script files, and Function file	4
5	Logical structures and flowcharting	6
6	2-D and 3-D graphics	6
7	Teaming and projects	4
8	Sketching and Lettering	2
9	Orthographic Projection	7
10	Pictorials	3
11	Scaling and Auxiliary Views	2
12	AutoCAD	6
13	Sectional Views	2
14	Dimensioning	2
15	Variability and Tolerance	2
16	Reviews/Exams	6.5
	Total Hours	**60.5**

ENGR 111A Topics: Spring 2006

Class	Topic
1.1	Introduction to ENGR 111
1.2	Lettering & Sketching
2.1	MATLAB Ch. 1: MATLAB Environment
2.2	Orthographic Drawings
3.1	MATLAB Ch. 2: Arrays
3.2	Pictorials
4.1	MATLAB Ch. 2: Matrices
4.2	Scaled Drawings & Auxiliary Views
5.1	MATLAB Ch. 3: MAT, Data & Script Files
5.2	AutoCAD Basics
6.1	MATLAB Ch. 3: Function Files
6.2	Orthographics in AutoCAD
7.1	MATLAB Ch. 3: Cell Arrays, Structure Arrays
7.2	Multi-view Drawings
8.1	Case Study
8.2	Pictorials in AutoCAD
9.1	MATLAB Ch. 4: Logical Operators & Conditional Statements I
9.2	Sectioned Orthographics Views
10.1	MATLAB Ch. 4: Logical Operators & Conditional Statements II
10.2	Multi-view Drawings in AutoCAD
11.1	MATLAB Ch. 4: For and While Loops
11.2	Standard Features
12.1	MATLAB Ch. 4: Debugging Programs; Review
12.2	Dimensioning in AutoCAD
13.1	MATLAB: Ch. 5: 2-D & 3-D Plots
13.2	Tolerances in AutoCAD
14.1	MATLAB: Ch. 5: Curve Fitting
14.2	Review

ABET 2000 Outcomes

Contributions to Professional Component:

1. Provides computer analysis foundation for engineering mechanics and structural analysis components in the sophomore and junior years.
2. Provides experience in project oriented team work.

Contribution to Facilities:

This course is taught in a classroom equipped with high-end personal computers for all students. Students are given hands on instruction with a modern computing language and computer aided graphics packages.

Relationship to Program Outcomes:

Objective	Assessment Method	ABET Outcomes**
By the end of the semester students should be able to complete routine programming assignments in MATLAB. This would include: problem analysis, flowcharting, coding, debugging and testing, and display of results in text and graphical formats. Programming would include the basics of: file creation and use, arithmetic and logical expressions, matrix manipulation, logical structures, development of functions, and 2-D and 3-D graphics.	Homework, Exams, Final Exam, Readiness Assessment Tests (RAT's)	3 (a, c, e, k)
Students should be able to work as teams and complete project team assignments with little supervision.	Homework, Readiness Assessment Tests (RAT's), Design Project Report	3 (d, f)
Students should learn how to benefit from "active collaborative learning" mode of teaching in a large class environment.	Homework, Exams, Final Exam, Readiness Assessment Tests (RAT's)	3 (h, i)
Students should demonstrate the ability to do neat work and to be well organized.	Homework, Design Project Report	3 (f, g)
Students should be able to create orthographic views of objects.	Homework, Exams, Final Exam, Readiness Assessment Tests (RAT's)	3 (g, k)
Students should be able to sketch objects freehand to communicate concepts.	Homework, Exams, Final Exam, Readiness Assessment Tests (RAT's)	3 (g, k)
Students should be able to draw isometric and oblique pictorials of objects.	Homework, Exams, Final Exam, Readiness Assessment Tests (RAT's)	3 (g, k)
Students should be able to visualize objects 3-dimensionally.	Homework, Exams, Final Exam, Readiness Assessment Tests (RAT's)	3 (g, k)
Students should be able to list and recognize the six major types of sectional views.	Homework, Exams, Final Exam, Readiness Assessment Tests (RAT's)	3 (g, k)

Students should be able to apply dimension and tolerances to orthographic views in accord with ANSI standards and conventional engineering practices	Homework, Exams, Final Exam, Readiness Assessment Tests (RAT's)	3 (g, h, k)
Given two toleranced, mating parts, students should be able to determine the type of fit and calculate the basic parameters of: Hole Tolerance, Shaft Tolerance, Allowance, and Maximum Clearance.	Homework, Exams, Final Exam, Readiness Assessment Tests (RAT's)	3 (a, g, k)
Students should be able to list the 14 geometric tolerance symbols and the name of each one.	Homework, Exams, Final Exam, Readiness Assessment Tests (RAT's)	3 (g, k)
Students should be able to use a modern Computer Aided Design Program to complete 2 dimensional drawings of objects.	Homework, Exams, Final Exam, Readiness Assessment Tests (RAT's)	3 (g, k)

** http://www.abet.org/images/Criteria/E001%2004-05%20EAC%20Criteria%2011-20-03.pdf