

**ENCE 453 - Computer-Aided Structural Analysis
Fall 2003**

Textbook: MCGUIRE, *MATRIX STRUCTURAL ANALYSIS-W/MASTAN2 CD*

Section	Lecture	Lec. room	Instructor
0101	TTh 3:30-4:45	EGR 1102	Chang, P.

Office Hour Schedule for Fall 2003

	Monday	Tuesday	Wednesday	Thursday	Friday
8-9					
		Office Hour		Office Hour	
9-10					
		ENCE 353		ENCE 353	
10-11					
		Office Hour		Office Hour	
11-12					
12-1					
1-2					
		Office Hour		Office Hour	
2-3					
3-4					
		ENCE 453		ENCE 453	
4-5					

Instructors: Dr. Peter Chang: EGR 1186, pchang@umd.edu, 5-1957

TA: None

TF: None

Lecture Schedule

Lec.	Date	Sections	Topics	Homework	
1	Tu, 9/2		Introduction		
2	Th, 9/4	2.4 – 2.6	Formulation of Truss Element Stiffness Matrix	2.4	
3	Tu, 9/9	3.1	Direct Stiffness Method	3.1(a)	3.1(d)
4	Th, 9/11	3.2	Direct Stiffness Method	3.4	
5	Tu, 9/16	3.3 – 3.4	Direct Stiffness Method	3.6	
6	Th, 9/18	4.1 – 4.5	Frame element	4.8(a)	4.8(b)
7	Tu, 9/23	5.2	Nodal and Element loads	5.8	
8	Th, 9/25		Boundary conditions		
9	Tu, 9/30		Review		
10	Th, 10/2		Exam 1.		
11	Tu, 10/7		Matlab		
12	Th, 10/9		Solution of Stiffness Equation by Matlab		
13	Tu, 10/14		Stiffness program using Matlab		
14	Th, 10/16		Stiffness program using Matlab		
15	Tu, 10/21		Stiffness program using Matlab		
16	Th, 10/23		Stiffness program using Matlab		
17	Tu, 10/28		Stiffness program using Matlab		
18	Th, 10/30		Stiffness program using Matlab		
19	Tu, 11/4	13.1	Static Condensation	13.2	
20	Th, 11/6	13.2	Substructuring	13.5	13.6
21	Tu, 11/11		Review		
22	Th, 11/13		Exam 2.		
23	Tu, 11/18	13.3	Relative constraints	13.12	
24	Th, 11/20	13.3	Relative constraints	13.15	
25	Tu, 11/25	13.4	Connections and Joints	13.17	
	Th, 11/27		Thanksgiving vacation		
26	Tu, 12/2	13.5	Connections and Joints	13.18	
27	Th, 12/4	13.6	Symmetry and Antisymmetry	Example 13.11 with load at d reversed	
28	Tu, 12/9	11.6	Error	11.5	
29	Th, 12/11		Review		
	Tu, 12/20		--- FINAL EXAM - 10:30AM-12:30 PM - EGR 1102 ---		

Website: <https://www.ajconline.umd.edu/>

Login, then select ENCE 453: Computer-Aided Structural Analysis (Portal) - Fall, 2003

Notes:

- Problems are assigned from the textbook or the class website (H-xx)
- Extra credit homework assignments may be assigned occasionally (instructor's discretion)

- Homework due on Tuesday includes all problems assigned during the previous week
- Homework policy is explained in more detail below

Grading Policy:

Homework/Quizzes/Class Part.	= 25%	All exams & quizzes are closed book/notes and given during recitation
Exam #1	= 25%	
Exam #2	= 25%	
Final Exam	= 25%	Final exam: Saturday, Dec 20, 10:30AM-12:30 PM

100%		

Course Expectations:

The objective of this course is to learn how to formulate structural analyses problems so that they can be solved by using computers. This approach has become the preferred method of structural analysis, and it will lead naturally to the finite element method. Fundamental principles and methods to be introduced include: (1) the direct stiffness method, (2) static condensation and substructuring, (3) energy method, (4) flexibility method, and (5) approximation methods. Simple examples will be used to illustrate these analysis methods.

The lecture section meets each week on Tuesday and Thursday. With only a short time to focus on the material, it is vital that these sessions start on time. Everyone is asked to arrive and be seated promptly, to minimize the disruption to others. Students are asked to read the assigned material for each class before the lecture. Lectures will include exercises of the material covered. These exercises will be collected and graded.

Homework Policy:

Homework will be assigned as the material is covered and will be collected every Tuesday at the beginning of the lecture period, starting on 9/9/03. Assignments turned in late will be docked 10% for each day it is late past the original due date. Homework will be returned on Tuesday of the following week. Solutions will be available on the class website after the problems are returned to you. *No assignment will be accepted after the answers are posted.* Students are encouraged to discuss and formulate solutions to the problems by working in teams. However, assignments *must* be completed and submitted individually. *Simply copying the answers from another student is not acceptable and will not be tolerated.* Guidelines for homework are given below:

1. Use good quality paper, such as engineering graph paper or college-ruled paper, with no spiral edges
2. Write on only one side of the paper
3. Include your name and page number (e.g. 1/3 means 1 of 3) on each sheet
4. Staple all pages together in the upper left corner
5. Neatly box all answers, and include appropriate units for numerical answers
6. Show all work (i.e. no work means no credit will be given)

If the above guidelines are not followed, the assignment will be rejected outright for extreme cases, or points will be deducted for items that do not conform to the specifications.

Quiz Policy:

Quizzes will be periodically given throughout the semester. Quiz problems will be similar to class examples, book examples, or homework problems. If you know how to complete these problems, you should do well on the quizzes. Quizzes will be administered during the recitations.

Note:

Use of calculators is encouraged (in fact, required) during classes, and for quizzes and exams. No PDA's, no laptops and no computers, however, will be allowed.