

CE 461
Structural Analysis II
Spring 2015
Class Information

Hours / Location: MWF 11:00 – 11:50, ESB 207

Professors: Dr. Karl E. Barth

Office: ESB 617

Office Hours: to be scheduled

Textbook: Structural Analysis, by: A. Kassimali

Organization:

- 3 lectures per week
- homework as assigned
- 3 examinations (2 during regular semester and 1 during finals week)

Grade Weighting:

• Homework	=	25 %
• Exam I	=	25 %
• Exam II	=	25 %
• <u>Exam III (during finals)</u>	=	<u>25 %</u>
Total	=	100 %

Topics: See attached schedule

Course Statement:

An accurate prediction of the behavior of a structure subjected to service loads and occasional extreme loads is indispensable in designing new structures and evaluating existing ones. This behavior is defined by the deformations and forces produced within the structure. The process of determining these values is known as **structural analysis**. The accuracy and reliability of such an analysis is purely a function of how well it's inherent assumptions and approximations match the actual "real-world" conditions.

This course will provide an in-depth study of various methods for the analysis of statically indeterminate structures. We will begin with the analysis of statically determinate structures subjected to moving loads, which is essential for the analysis of bridge and crane structures as well as for the determination of pattern loading. We will then present several classical methods of indeterminate analysis and finally end with the coverage of the matrix stiffness methods, presently the leading method used in the structural engineering profession.

Homework Policy:

- **Your name, course number, problem number, and due date must appear on all homework**
- **Successive pages of multiple page sets must be initialed and should have the pagination (i.e., 1/3, 2/3, 3/3, etc.) in the upper right-hand corner of the page**
- **All assignments are to be done NEATLY using**
 - **Pencil**
 - **Engineering paper**
 - **each problem should be started on a new sheet of engineering paper**
 - **only one side of the paper is to be used (the lighter side)**
 - **Straight edges must be used for all figures**
- **Multiple-page sets are to be stapled together in the upper left hand corner**
- **Late homework will not be accepted**

Examination Policy:

- Exams will be focused on specific areas of material coverage rather than being comprehensive.
- Exams will be closed textbook and closed notes, however we will make use of appropriate sections of the AISC specifications.
- ***You are to work on one side of the paper only on your exam sheets.***
- In the event that you question the grading of an exam problem, you must write an "appeal" summarizing your concerns, staple this to your exam, and submit this to the instructor. Note that the appeal should be typewritten and must be filed no later than, but inclusive of, the second class period following the return of the exam.

Attendance Policy:

- You are expected to attend class.

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Tentative Schedule

<u>Week</u>	<u>Class Dates</u>	<u>Class Topics</u>
1	01/12, 01/14, 01/16	Introduction
2	01/19 , 01/21, 01/23	Influence Lines <i>No Class 01/19 (Martin Luther King Jr. Day)</i>
3	01/26, 01/28, 01/30	Influence Lines & Approximate Frame Analysis
4	02/02, 02/04, 02/06	Moment Distribution Method
5	02/09, 02/11, 02/13	Moment Distribution Method & Cables/Arches
6	02/16, 02/18, 02/20	Virtual Work Rev. & Method of Cons. Def. <i>*Exam 1*</i>
7	02/23, 02/25, 02/27	Method of Consistent Deformations
8	03/02, 03/04, 03/06	Method of Consistent Deformations & Matrix Algebra
9	03/09, 03/11, 03/13	Matrix Stiffness Method (Introduction & Axial Elem.)
10	03/16, 03/18, 03/20	Matrix Stiffness Method (Axial Elem. & Assembly) <i>*Exam 2* (03/20 – Last Day to Drop a Class)</i>
11	03/23 03/25, 03/27	<i>No Classes (Spring Recess)</i>
12	03/30, 04/01, 04/03	Matrix Stiffness Method (Coordinate Transforms) <i>No Class 04/03 (Good Friday)</i>
13	04/06, 04/08, 04/10	Matrix Stiffness Method (Beam/Frame Elements)
14	04/13, 04/15, 04/17	Matrix Stiffness Method (Indeterm. Frame Analysis)
15	04/20, 04/22, 04/24	Computer Applications & Advanced Topics
16	04/27, 04/29, 05/01	Computer Applications & Advanced Topics
17	<i>Final Exam – Thursday, May 7th</i> <i>3:00 pm – 5:00 pm</i>	