

CEE 152 COMPUTER METHODS IN STRUCTURAL ANALYSIS AND DESIGN
(Elective for CE)

Catalog Data:	CEE 152: Computer Methods in Structural Analysis and Design (Credit Units: 4) S. Matrix techniques for indeterminate framed structures. Computer implementation using the stiffness method. Software packages for design of reinforced concrete, steel, and/or timber structures. Prerequisite: CEE151C and CEE 153. (Design units: 2)
Textbook:	S.D. Rajan: <i>Introduction to Structural Analysis and Design</i> , John Wiley & Sons, Inc., 2001.
References:	Software STAAD.Pro Description at www.reiworld.com
Coordinator:	Lizhi Sun
Course Objectives:	This course provides computer applications for the analysis and design of civil engineering structures.
Course Outcomes:	Students will: Identify, formulate, and solve statically indeterminate structural problems using the force method. Identify, formulate, and solve statically indeterminate structural problems using the slope-deflection method. Identify, formulate and solve statically indeterminate structural problems using the direct stiffness method. Use the techniques, skills, and modern engineering tools (software) necessary for analyzing and designing statically indeterminate structures. Demonstrate base-level competency in structural design under realistic loads using design codes/specifications/software
Prerequisites By Topic:	Analysis of statically indeterminate structures Design of timber and concrete structures
Lecture Topics:	Basic concepts of structural analysis (0.5 week) Fundamentals of the flexibility method (1.5 weeks) Fundamentals of the stiffness method (2.0 weeks) Fundamentals of the slope-deflection method (1.5 weeks) Computer programs for framed structures (1 week) Introduction to computer design packages (1.5 weeks) Application of software for design of specific structures (2 weeks)
Class Schedule:	Meets for 3 hours of lecture and 1 hour of lab each week for 10 weeks.
Computer Usage:	Students use structural design software such as STAAD for solving homework problems and/or structural design assignments.
Laboratory Projects:	Students are required to conduct a structural design assignment.
Professional Component:	Contributes to the design experience and Engineering Topics courses of Civil Engineering major.

Relationship to Program Outcomes: CE – The course related to Program Outcomes a, c, e, and k as stated at: <http://undergraduate.eng.uci.edu/degreeprograms/civil/mission>

Design Content Description

Approach: Students are exposed to taking advantages of engineering design tools such as commercial software for structural design problems. In addition, students are assigned to conduct a team design project to evaluate realistic engineering design case for a typical statically indeterminate bridge structure subject to realistic truck live loads.

Lectures: 75%

Laboratory Portion: 25%

Grading Criteria:

Homework:	30%
Midterm(s):	20%
Design Project:	20%
Final:	<u>30%</u>
	100%

Estimated ABET Category Content:

Mathematics and Basic Science: ___ credit units or ___%

Engineering Science: 2 credit units or 50 %

Engineering Design: 2 credit units or 50 %

Prepared by: Lizhi Sun **Date:** July 2007

CEP approved: Spring 2001