3. To be Cross-listed as: ___________________________  Signature: Department Chair

4. Proposed change in Bulletin description:
   (a) Present description (including prerequisite(s)):
       Design loads and structural systems. Systems concepts in planning, analysis, design, and construction of structures. Buildings, bridges, special structures and foundations. Computer aided design and drafting (CADD) utilizing microcomputers. Written and oral presentations of student projects will be required.
   (b) New description:
       Design loads. Structural systems and bracing. Analysis and design of buildings and bridges. Use of computer systems for design projects. Written and oral presentations required.
   (c) Prerequisite(s) for course as changed: CE486G and CE487G; Prereq or concur: CE579; or consent of instructor

5. What has prompted this proposal?
   Curriculum change. Part of the material has been covered by the capstone design course (CE429). CE589 has been reduced from a capstone design course to a technical elective course.

6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes:
   General technical topics have been shifted to the new capstone design course (CE429). The special features related to structural system design will be covered exclusively.

7. What other departments could be affected by the proposed change?
   None

8. Is this course applicable to the requirements for at least one degree or certificate at the University of Kentucky? ☑ Yes ☐ No

9. Will changing this course change the degree requirements in one or more programs?*
   If yes, please attach an explanation of the change.*
   ☑ Yes ☐ No

10. Is this course currently included in the University Studies Program?
    If yes, please attach correspondence indicating concurrence of the University Studies Committee.
    ☑ Yes ☐ No

11. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted.

*NOTE: Approval of this change will constitute approval of the program change unless other program modifications are proposed.
University of Kentucky
Application for Change in Existing Course: Major & Minor

12. Is this a minor change? [ ] Yes [ ] No
   (NOTE: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)

13. Within the Department, who should be consulted for further information on the proposed course change?
   Name: Dr. Shien T. Wang
   Phone Extension: 257-4916

Signatures of Approval:

[Signature]
Department Chair

[Signature]
Dean of the College

[Signature]
**Undergraduate Council

[Signature]
**Graduate Council

[Signature]
**Academic Council for the Medical Center

[Signature]
**Senate Council

**If applicable, as provided by the Rules of the University Senate.

Date of Notice to the Faculty: 3/17/03

Date of Notice to University Senate:

Action Other Than Approval

The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

- a. change in number within the same hundred series;
- b. editorial change in description which does not imply change in content or emphasis;
- c. editorial change in title which does not imply change in content or emphasis;
- d. change in prerequisite which does not imply change in content or emphasis;
- e. cross-listing of courses under conditions set forth in item 3.0;
- f. correction of typographical errors. [University Senate Rules, Section III - 3.1]

Rev 8/02
CE 589 Design of Structural Systems

Catalog data

Design loads. Structural structural systems and bracing. Analysis and design of buildings and bridges. Use of computer systems for design projects. Written and oral presentations required. Prereq: CE487G and CE486G; Prereq or concur: CE579; or consent of instructor.

Textbook


Reference

AASHTO Standard Specifications for Highway Bridges
Building Design Codes (Kentucky Building Code, UBC, ANSI)
STAADPRO User's Manual
RAM Integrated System Manual
COMSPAN and CONSYS Manuals
AutoCAD User's Manual
SIMONS User's Manual
AISC Manual of Steel Construction (LRFD)
ACI Reinforced Concrete Design Specifications

Coordinator

S. T. Wang, Professor

Prerequisites

CE 487G and CE 486G; Prereq or concur: CE 579; or consent of instructor

Topics

1. Introduction
2. Computer aided analysis and design
3. STAAD PRO and RAM INTEGRATED Structural Analysis and Design System
4. Finite Element Method and Modeling
5. Design sequence and procedure
6. Design loads
7. Design of buildings and foundations
8. Architectural Considerations
9. Design of high-rise structures
   Wind and earthquake load
   Fireprotection
   Bracing systems
   Structural systems
   Structural modeling
   Future trend in design
   Case studies

10. Design of special structures
    Structural forms
    Classification of special structures
    Space trusses and frames
    Folded plates
    Shell structures
    Suspension type structures
    Cable stayed structures
    Arch systems
    Domes
    Tensile membrane structures
    Pneumatic structures
    Case studies

11. Prestressed and precast concrete

12. Design of bridges
    ASSHTO bridge design loads
    Influence lines
    Force envelope
    Bridge types
    ASSHTO bridge design specifications
    Design procedures
    CONSPAN and SIMONS computer software
    Case studies

13. Structural failures
    Building failures
    Bridge failures
    Structural redundancy
    Factors affecting structural stability
    Lessons learned from failures

14. CAD
    Software selection
    Hardware
    Productivity
    Quality Assurance
    Responsibility
    Structural integrity and safety
Goals

This is a technical design elective to teach students who are interested in behavior and design of structural systems (buildings and bridges, steel and concrete) utilizing computers in the design process so that the students will become familiar with skills required for the overall structural system analysis and design.

Specific Learning Outcomes

Objective 1. To understand basic design criteria, and procedure of structural systems,
Objective 2. To understand various theoretical background of structural systems through case studies,
Objective 3. To use computer software for structural analysis and design and for architectural and engineering drawings,
Objective 4. To work cooperatively through team work, and
Objective 5. To communicate through written and oral presentations.

Laboratory

Two lecture hours are spent on subjects listed under topics. One laboratory hour is spent on two design projects, one building and one interstate highway bridge. This laboratory hour is mainly for team meetings.

ABET Category

Engineering design: 3 credit hrs or 100%

Course Relevance

This is a technical design elective for students who are interested in structural Analysis and design. The students will have the opportunity to carry out realistic design projects in building and bridge, which is similar to the work performed by the professional engineers. This course is intended to provide students with competent professional background and to serve as a prelude before they enter the work force.

Grading

Homework 20%
Design Projects (written reports and graphics) 60%
Presentation and Team Communication Skills 20%
Students with graduate standing additional assignments are required.