

CVEN 483-500 ANALYSIS AND DESIGN OF STRUCTURES

Description: Overall procedure of design including structural analysis, load determination, codes and standards, structural systems, design drawings and specifications and cost comparisons as applied to buildings, bridges or special structures.

Prerequisites: CVEN 365, 444 and 446 or permission of instructor.

References: ASCE/SEI Standard A7-10 - Minimum Design Loads for Buildings and Other Structures, Reston, Virginia.

International Building Code, International Code Council, 2012.

Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary (ACI 318-R-14), American Concrete Institute, Farmington Hills, MI.

Steel Construction Manual, Thirteenth Edition, 2011, Chicago, IL.

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<http://ceprofs.tamu.edu/bracci/bracci.htm>

Class Hours: *Lecture:* T,R: 2:20-3:10 PM 217 CE Bldg
Lab: T 3:30-6:20 PM 217 CE Bldg

Office Hours: T,R: 12:00-2:00 PM or by appointment through email.

Grading: HW/Mid-Term Exam 40 pts and Project 60 pts (term).
Total: >90 A; >80 B; >70 C; >60 D; <60 F

Course Objectives/Learning Outcomes:

Prepare students to analyze and design structural elements and systems according to the IBC model building code using loads from the ASCE/SEI Standard A7-10 and specific material codes such as the ACI Building Code Requirements for Structural Concrete and the AISC Steel Construction Manual.

1. Identify structural building types and how they function in resisting loads;
2. Evaluate appropriate mathematical models for the structural building types;
3. Determine the loading criteria on the structural systems;
4. Determine critical loading patterns for design;
5. Analyze the effect of loads on the structural system;
6. Design members to resist applied loads and satisfy performance objectives;
7. Sketch members of structural system to be used to prepare construction documents.

Course Contents and Approximate Schedule:

Week	Subject
1	Identify structural building types and how they function in resisting loads
2	Identify student team project assignments with structural engineers from WPM
2-4	Evaluate appropriate mathematical models and ETABS software for the structural building types
5-9	Determine the loading criteria on the structural systems
10-11	Identify structural foundation types and their design
11-12	Introduction to composite steel-concrete elements and structures
12-13	Introduction to prestressed concrete
5-14	Project discussion and completion
15	Oral Presentation and Technical Report of Final Project

Course Assignments:

Course projects will be assigned during the first month of the semester and finalized after presentations to structural engineers. Students will work in groups to carry out the tasks of the entire project on a weekly basis. Weekly homework assignments will complement term projects.

ABET Professional Content:

1. Preparation for engineering practice;
2. Major design experience;
3. Engineering design incorporating of engineering standards;
4. Engineering design incorporating realistic constraints that included economic, environmental, health and safety.

ABET Outcomes Addressed:

1. Ability to apply knowledge of basic mathematics, science and engineering;
2. Ability to design a civil/ocean engineering system to meet desired needs;
3. Ability to formulate and solve civil/ocean engineering problems;
4. Understanding of professional and ethical responsibility;
5. Ability to communicate effectively (verbal and written);
6. Recognition of the need to engage in life-long learning;
7. Ability to use techniques, skills, and modern tools necessary for civil/ocean engineering practice;
8. Ability to use computers to solve civil/ocean engineering problems

Class Attendance Policy:

Class attendance is required for all students at all classes -- **there are no exceptions**. There is no legitimate reason for you to miss class during the scheduled hours except for a university excused absence. This policy is enforced through the homework/pop quiz grade. Homework is due at the beginning of the class (late = absent) -- **there are no exceptions**.

Major Exams and Finals:

The times for the major exams will be announced in class and the final exam time is listed in the university course schedule for this class. There are no scheduled make-up exams. You are expected to show up at the appointed times and take the exams like everyone else in the class unless there is a documented University Excused absence as defined below. **There are no exceptions**.

Additional Information:

Section 1 of Student Rules– Class Schedules Extract

“1.14 Class Schedules -All classes will meet according to schedules prepared by the registrar. Modification in these schedules, including common night exams, may be made only when authorized by the registrar and approved by the dean of the college in which the course is offered.”

Section 10 of Student Rules

“10.1 The course instructor shall provide in writing the following information to the class during the first class meeting:

- A statement of the nature, scope and content of the subject matter to be covered in the course.
- All course prerequisites as listed in the catalog.
- All required course text and material.
- The grading rule, including weights as applicable for tests, laboratory assignments, field student work, projects, papers, homework, class attendance and participation and other graded activities in the calculation of the course grade. No such rule should be in contradiction to other provisions of the University Student Rules.”

“10.4 Passing grades for graduate students are A, B, C and S.”

Section 7 of Student Rules – Attendance Extracts

“The university views class attendance as an individual student responsibility. Students are expected to attend class and to complete all assignments. Instructors are expected to give adequate notice of the dates on which major tests will be given and assignments will be due. This information should be provided on the course syllabus, which should be distributed at the first class meeting. Graduate students are expected to attend all examinations required by departments or advisory committees as scheduled formally.”

“7.1 The student is responsible for providing satisfactory evidence to the instructor to substantiate the reason for absence. Among the reasons absences are considered excused by the university are the following:”

“7.1.1 Participation in an activity appearing on the university authorized activity list. ([see List of Authorized and Sponsored Activities](#))

“7.1.2 Death or major illness in a student’s immediate family. Immediate family may include: mother, father, sister, brother, grandparents, spouse, child, spouse’s child, spouse’s parents, spouse’s grandparents, stepmother, step-father, step-sister, step-brother, step-grandparents, grandchild, step-grandchild, legal guardian, and others as deemed appropriate by faculty member or student’s academic dean.

“7.1.3 Illness of a dependent family member.

“7.1.4 Participation in legal proceedings or administrative procedures that require a student’s presence.

“7.1.5 Religious holy day. (See Appendix IV.)

“7.1.6 Injury or illness that is too severe or contagious for the student to attend class.”

“7.1.6.1 Injury or illness of three or more days. For injury or illness that requires a student to be absent from classes for three or more university business days (to include classes on Saturday), the student should obtain a medical confirmation note from his or her medical provider. The Student Health Center or an off-campus medical professional can provide a medical confirmation note only if medical professionals are involved in the medical care of the student. The medical confirmation note must contain the date and time of the illness and medical professional's confirmation of needed absence.”

“7.1.6.2 Injury or illness less than three days. Faculty members may require confirmation of student injury or illness that is serious enough for a student to be absent from class for a period less than three university business days (to include classes on Saturday). At the discretion of the faculty member and/or academic

department standard, as outlined in the course syllabus, illness confirmation may be obtained by one or both of the following methods:

- a. Texas A&M University Explanatory Statement for Absence from Class form available at <http://attendance.tamu.edu>
- b. Confirmation of visit to a health care professional affirming date and time of visit.”

“7.1.6.3 An absence for a non acute medical service does not constitute an excused absence.”

“7.1.7 Required participation in military duties.

“7.1.8 Mandatory admission interviews for professional or graduate school which cannot be rescheduled.”

“7.2 If the student is found to be too ill to attend class by a Health Center physician, the director of the Health Center or his/her representative will, on request of the student, confirm this fact.”

“7.3 If an off-campus physician provides evidence of a student’s illness, the excuse documentation must contain the date and time of the illness and doctor’s opinion that the student was too ill to attend class. If a physician determines that the student is not ill, he or she will not receive an excuse. If no evidence is available, the instructor will decide whether makeup work will be allowed. “

“7.5 If the student is seeking an excused absence, the student must notify the instructor as soon as possible after the absence, but no later than the end of the second working day after the last date of absence. If the absence occurs the same day as a scheduled exam or other graded procedure, the student must notify his/her instructor or department by the end of the next working day after the absence in order to ensure full rights. The student is responsible for providing satisfactory evidence to the instructor within one week of his or her absence return to substantiate the reason for absence. If the absence was excused, the instructor must either provide the student an opportunity to make up the exam or other work missed or provide a satisfactory alternative completed within 30 calendar days from the last date of absence.”

“7.6 The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence.”

OFFICIAL NOTICES

ADA

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 Disability Services in Cain, Hall, Room B118, or call 845-1637. For additional information, visit <http://disability.tamu.edu>.

Academic Integrity Statement

“An Aggie does not lie, cheat, or steal or tolerate those who do.” Students are expected to understand and abide by the Aggie Honor Code presented on the web at: <http://www.tamu.edu/aggiehonor> No form of scholastic misconduct will be tolerated. Academic misconduct includes cheating, fabrication, falsification, multiple submissions, plagiarism, complicity, etc. These are more fully defined in the above web site. Violations will be handled in accordance with the Aggie Honor System Process described on the web site.

Copyright Statement

The handouts used in this course are copyrighted. By “handouts,” it is meant that all materials generated for this class, including those materials generated in all previous semesters. Such materials include but are not limited to syllabi, notes, quizzes, problem sets, exams, worked problems, in-class materials, review sheets,

and additional problem sets. Because these materials are copyrighted, you do not have the right to copy them outside of the normal course uses for which they were intended. Certain violations of these copyrights can be treated as violations of academic integrity and will be handled in accordance with the Aggie Honor System Process described on the following web site: [http:// www.tamu.edu/aggiehonor](http://www.tamu.edu/aggiehonor).

Cheating on quizzes and exams will not be tolerated. Cheating will be reported and handled in accordance with the Aggie Honor System Process. Some or all examinations will be closed book; “looking at another student's examination or using external aids (for example, books, notes, calculators, conversation with others, or electronic devices)” during these examinations is a violation of Texas A&M Aggie Honor Code, Cheating, unless specifically allowed in advance by the instructor.

Unless specifically allowed in advance by the instructor, all assignments and homework in this class are expected to be completed based on individual effort. Copying the work of others, including homework, is a violation of Texas A&M Aggie Honor Code, Cheating.