

University of Texas at Tyler - Department of Civil Engineering
CENG 3325-031 ~ Structural Analysis
Spring 2025 (**Subject to Revision**)

Instructor: Shariful Huq
HEC A204
shuq@uttyler.edu

Office Hours: Tu-Th 12:30 pm ~ 3:30 pm
or By Appointment

Lectures:

Tuesday/Thursday: 9:30 am - 10:50 am, HEC A217. Exams will likely be held in HEC C204.

Note to Student about a Syllabus

This syllabus is a statement of intent about how the course will be taught this semester. It outlines what we will cover, what you will need to do in the course, and it explains what and when you must do it to successfully complete the course and get a great final grade. This syllabus is intended to protect you from arbitrary or untimely changes in course requirements and due dates. But I reserve the right to make changes as necessary to the syllabus with announcement of changes. As we learned during 2020 (Covid-19 era), there are many circumstances outside of our direct course control that may require changes to this syllabus in content and schedule. These will always be announced in advance and the syllabus will be updated on Canvas so all can be aware of the required changes.

Important Artificial Intelligence (AI) Information

AI is not permitted in this course at all. I expect all the work students submit for this course to be their own. I have carefully designed all assignments and class activities to support your learning. Doing your own work, without human or artificial intelligence assistance, is best for your efforts in mastering course learning objectives. **For this course, I expressly forbid using ChatGPT or any other artificial intelligence (AI) tools for any stages of the work process, including brainstorming.** *Deviations from these guidelines will be considered a violation of UT Tyler's Honor Code and academic honesty values.*

Important Covid-19 Information for Classrooms and Laboratories

It is important to take the necessary precautions to ensure a healthy and successful year. UT Tyler continues to urge you to protect yourselves against the flu, COVID and any new threats that may be developing. Be diligent about preventive measures such as washing hands, covering sneezes/coughs, social distancing and vaccinations, which have proven to be successful in slowing the spread of viruses. **Encourage those who don't feel well to stay home, and if they show symptoms, ask them to get tested for the flu or COVID. Self-isolation is important to reduce exposure** ([CDC quarantine/isolation guidelines](#)). Please work with your faculty members to maintain coursework and please consult [existing campus resources](#) for support.

Course Website:

Canvas will be used to manage the course material for the semester. There you will find homework assignments/solutions, lecture handouts, and other material pertaining to the class. Students are responsible for collecting notes from fellow students for missed class. **Collected homework will be graded either for points or completion only. Please check canvas regularly.**

Catalog Description:

Introduction to structural requirements, structural systems and specifications of loads; analysis of statically determinate and indeterminate structures using equations of equilibrium, moment distribution and energy methods; determination of design forces in the structural components including shear force and bending moment; and brief introduction to the direct stiffness method.

Learning Objectives:

1. Develop an organized approach to solving structural analysis problems.
2. Understand the structural behavior of simple beams subjected to basic loading conditions.
3. Analyze determinate and indeterminate beams.
4. Understand the structural behavior of frames subjected to basic loading conditions.
5. Analyze determinate and indeterminate frames.
6. Understand the structural behavior of trusses subjected to basic loading conditions.
7. Analyze determinate and indeterminate trusses.
8. Apply equilibrium to solve structural analysis problems.
9. Apply approximate methods in structural analysis.
10. Apply the Force (Flexibility) Method to solve structural analysis problems.
11. Apply Displacement (Stiffness) Methods to solve structural analysis problems.
12. Analyze simple structural members using real design loads and the Load and Resistance Factor Design Codes.
13. Use spreadsheets and math solving tools (Mathcad, MATLAB etc.) to perform mathematical operations required in structural analysis.
14. Use free student version of SkyCiv (<https://skyciv.com/>) or any other finite element program as a tool to analyze and design trusses, beams, and frames.

Prerequisite:

CENG 3306: Mechanics of Materials

Required Text:

Structural Analysis, Hibbeler 10th Edition, Pearson Prentice Hall, Upper Saddle River, NJ, 2012.
ISBN-13: 978-0-13-3942842

Exams:

There will be 2 midterm examinations and one final examination. The exams are **TENITATIVELY** scheduled for:

Exam 1: **Thursday March 6th**

Exam 2: **Thursday April 17th**

Final Exam: **April 29th or May 1st TBD by Univ. Admin**

Final Exam: There is **no make-up or rescheduling**.

Mid-term Exams: In general midterm exam dates may be moved up or pushed back depending on the progress of the lectures. Each student is only allowed one make-up exam. That is, he/she can only make-up Exam 1 or Exam 2. Make-up for the Exams will only be arranged if you inform the instructor **prior to** or **on the day before** the exam, with a strong valid reason. **Examples of strong valid reasons (unexpected events and cannot be rescheduled) are** official UT Tyler travel, accident, illness, childbirth, passing of an immediate family member, jury duty, or court appearance. You will be required to show **documentary evidence for valid reasons** (e.g., official university letter, doctor's letter, letter from funeral home, police report, court letter etc.). Events that can be pre-scheduled or rescheduled are not considered valid reasons. **Examples of non-valid reasons** are traffic, wedding, driving test, sending car for service, clash with another course schedule, etc. Job interviews will be considered on a case-by-case basis (again, with documentary evidence). If an emergency happens during the exam day, you should contact the instructor at the earliest possible time (or call the HEC Engineering office or contact one of your classmates or TA who will then inform the instructor). Any make-up exam will be given on the last day of classes **(April 25, 2025)**.

To compensate for the fact that you may apply what you learn in the entire course when answering make-up Exams 1 or 2, **the make-up exam will be more difficult than the original exam**.

Exam Rules

Mid-Term and the Final Exam are closed notes. You are only allowed to use an NCEES approved calculator and instructor approved reference sheet(s).

Topics to be tested will be announced in class and on Canvas one week prior to the exam. The instructor will set questions from material taught in class. The meaning of “taught in class” includes verbal instructions or written notes on Canvas. It is very important that you attend the class activities and take additional notes.

To discourage students from focusing narrowly on only a few questions, **no practice exam will be given**. There are enough self-practice problems as well as in the textbook at the end of each chapter. **Solutions to midterm exams will NOT be posted on canvas**. Any other instruction specific to an exam will be posted on Canvas.

Students who fail to show up for the make-up or final exam for an invalid reason will be given 0 points for that exam. An incomplete “I” grade will be given for missing the final exam with properly documented strong valid reason. He/she must take the final exam the next time this course is being offered to have the “I” grade changed to a letter grade. All assessment components and marks will be retained for the calculation of the final letter grade. The letter grade will be benchmarked against the same class for the semester in which the exam had been missed.

You are NOT allowed to work with anyone on the exam. You must work independently. No use of the internet, textbooks, notes or any other resources. Carry through all units in the problem.

Any student found in violation of these rules and as such in violation of UT-Tyler student code of conduct will be subjected to penalties ranging from receiving a zero grade on the respective exam or suspension or expulsion from the university.

Homework:

Homework will be assigned on a regular basis. Homework **will be collected and graded either for points or completion only. To receive full completion grade - Homework must be uploaded on canvas by the due date and time. No late homework will be accepted** except for strong valid reasons (listed above) and arrangements are made with the instructor ahead of time.

Homework solutions will be posted on canvas after the due date. Homework should be submitted on engineering paper. Solutions should be presented in a clear methodical manner. Follow the “homework submission guidelines” listed below when completing your assignment. Assignments which are not clearly presented may have 5 percentage points deducted from the overall grade of that assignment. Be sure that you use the correct edition/version of the textbook. Problems done from other edition/versions which do not match the assigned problems will not receive credit.

Homework Submission Guidelines (Professionalism Requirements):

1. Homework should be submitted using letter size (8 ½ x 11”) paper. Engineering paper is preferred but plain white paper is allowed if you have no access to engineering paper.
2. The header of the first page should include the following:
 - a. Name of Student
 - b. Student ID Number
 - c. Course Number and Name
 - d. Homework Number
3. There should be no more than 2 problems per page. This is to ensure that there is enough space on the paper for the grader to add comments.
4. Multiple sheets should have a page number labeled at the left corner of the page.
5. The submitted pdf file should show the pages free of frail edges, stains, smudges and wrinkles.
6. All problems should include:
 - a. Problem Number
 - b. A diagram of the problem (draw all free body diagrams when necessary)
 - c. A set of given quantities
 - d. A set of unknown quantities
 - e. A set of assumptions
7. All numbers and writing should be clear and readable.
8. When required to produce a graph, use a computer program such as excel or MATLAB or Mathcad to generate the plot. **Do not draw it by hand!**
9. The **final answer should be boxed** and placed at the bottom of the problem.

Quizzes:

I may give announced or unannounced quizzes throughout the semester. These quizzes may cover assigned reading material or material covered in previous lectures.

Grades:	Grade Scale:
Homework/Quizzes = 20%	A: 90-100
Professional Practice* = 10%	B: 80-89
Midterm Exams (2*20%) = 40%	C: 70-79
Final Exam (comprehensive) = 30%	D: 60-69
	F: <60

If necessary, I reserve the right to adjust the grade scale at the end of the semester to the students benefit.

****NOTE:** There will be no makeup work or extra credit allowed/granted at the end of or during the semester unless allowed/granted to everyone by the instructor. All assignments must be turned in at the appropriate time to receive credit.

***Professional Practice Grade Breakdown:**

Your professional practice grade will be computed based upon your attendance (35%) plus participation in the course (35%) plus participation in professional organizational activity (30%) (such as ASCE, AISC events). The professional organizational activity grade of 30% will go towards attending a minimum of 3 professional organizational events and subsequent submission of one mini report describing the meeting contents. A document template is uploaded to canvas for recording the meeting contents. For attendance during class meetings, there will be roll call of the students.

In grading the homework, assignments, tests, exams, etc., **no credit will be given to methods not covered in this class**, although these methods, tables, formulae may appear in the textbook. Errors or outdated material in the textbook should not be the reason for claiming full credit on work done.

To protect your confidentiality, graded homework, assignments, and exams will not be placed in the open area for collection. They will only be distributed by the instructor during class or office hours. Graded homework, assignments, and exams not collected before the final exam week will be disposed according to UT Tyler policy.

Laptops/PDAs/MP3 players/Cell Phones or other electronic devices

- The use of any electronic device, except an approved calculator, is not permitted during exams. Your exam will be collected, and your grade will be a zero if you are caught using a non-approved electronic device/calculators. Any instances of a calculator inappropriately used during an exam will be the basis of alleging Academic Misconduct and may result in Failing (F) of the course at the determination of the course's instructor or the basis for a recommendation for expulsion from the University. Any Calculator used during an exam in this course must meet the requirements stated within the policy below.

- Calculator Policy**

Only NCEES approved calculators will be permitted during tests and your test will be collected and your grade will be a zero if you are using a non-approved calculator.

The approved calculators include the following: (Please check the NCEES website for a complete listing, <https://ncees.org/exams/calculator/>. Below is an excerpt from the website:

Calculator policy

To protect the integrity of its exams, NCEES limits the types of calculators examinees may bring to exam sites. The list of approved calculators is reviewed annually. The approved calculators include the following: (Please check the NCEES website for a complete listing, <https://ncees.org/exams/calculator/>).

The following calculator models are the only ones acceptable for use during the **2024 exams**:

- Casio: All fx-115 and fx-991 models (Any Casio calculator must have “fx-115” or “fx-991” in its model name.)
- Hewlett Packard: The HP 33s and HP 35s models, but no others
- Texas Instruments: All TI-30X and TI-36X models (Any Texas Instruments calculator must have “TI-30X” or “TI-36X” in its model name.)

Final day to withdraw:

The final day to withdraw from the course without penalty is **March 31st, 2025**.

Census dates:

The university requires that instructors report the attendance to the register at various points in the semester. The census date is **January 27th, 2025**.

The Census Date is the deadline for many forms and enrollment actions that students need to be aware of. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a “W” grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment.
- Completing the process for tuition exemptions or waivers through Financial Aid

UT Tyler Honor Code:

Every member of the UT Tyler community joins together to embrace: Honor and Integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Student Standards of Academic Conduct: Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

- i. “Cheating” includes, but is not limited to:
 - copying from another student’s test paper.
 - using, during a test, materials not authorized by the person giving the test.
 - failure to comply with instructions given by the person administering the test.
 - possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed “crib notes”. The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test.
 - using, buying, stealing, transporting, or soliciting in whole or part the contents of an un-administered test, test key, homework solution, or computer program.
 - collaborating with or seeking aid from another student during a test or other assignment without authority.
 - discussing the contents of an examination with another student who will take the examination.
 - divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student.
 - substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment.
 - paying or offering money or other valuable thing to, or coercing another person to obtain an un-administered test, test key, homework solution, or computer program or information about an un-administered test, test key, home solution or computer program.
 - falsifying research data, laboratory reports, and/or other academic work offered for credit.
 - taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
 - misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.
- ii. “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.
- iii. “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

- iv. All written work that is submitted will be subject to review by plagiarism software.

UT Tyler Resources for Students:

- [UT Tyler Writing Center](http://www.uttyler.edu/writingcenter) (903.565.5995), writingcenter@uttyler.edu
- [UT Tyler Tutoring Center](http://www.uttyler.edu/tutoring) (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in earlycareer courses.
- UT Tyler Counseling Center (903.566.7254)

Collection of Student Work:

Throughout the semester I **may collect** student work (best, average, and worst) for the ABET course and outcomes notebooks. This will require me to make a copy of your work, keep your original and return a copy of the graded work to you. I will not draw attention as to what level of work you accomplished.

Students Rights and Responsibilities: To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link:
<http://www.uttyler.edu/wellness/StudentRightsandResponsibilities.html>

Grade Replacement/Forgiveness: If you are repeating this course for a grade replacement, you must **file intent to receive grade forgiveness with the registrar by the 12th day of class**. Failure to do so will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates will receive grade forgiveness (grade replacement) for only three course repeats; graduates, for two course repeats during his/her career at UT Tyler.

State-Mandated Course Drop Policy: Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the 12th day of class (See Schedule of Classes for the specific date). Exceptions to the 6-drop rule include, but are not limited to, the following: totally withdrawing from the university; being administratively dropped from a course; dropping a course for a personal emergency; dropping a course for documented change of work schedule; or dropping a course for active duty service with the U.S. armed forces or Texas National Guard.

Petitions for exemptions must be submitted to the Registrar's Office and must be accompanied by documentation of the extenuating circumstance. Please contact the Registrar's Office if you have any questions.

Disability/Accessibility Services: In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Tyler at Texas offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including non-visible a diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The

Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with an Accessibility Case Manager. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150 or call 903.566.7079.

Student Absence due to Religious Observance: Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities: If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement: It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation: Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. **Do Not** re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services

UT Tyler a Tobacco-Free University: Beginning August 15, 2016, all forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation programs available to students looking to quit smoking, including counseling, quit lines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Campus Carry: We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at:

<http://www.uttyler.edu/about/campus-carry/index.php>.