

**Instructor:** Shariful Huq  
Office: HEC A204  
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**Office Hours:** Hrs. below or by appointment  
Mo/We: 1:30PM-3:30PM (Rm. HEC D113)  
Tu/Th: 11:00AM-12:00PM (Rm. HEC A204)

**Lectures:**

MWF 9:05AM-10:00AM

**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, 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 Covid-19 Information for Classrooms and Laboratories**

Students are expected to wear face masks covering their nose and mouth in public settings (including classrooms and laboratories), as specified by [Procedures for Fall 2020 Return to Normal Operations](#). The UT Tyler community of Patriots views adoption of these practices consistent with its [Honor Code \(Links to an external site.\)](#) and a sign of good citizenship and respectful care of fellow classmates, faculty, and staff.

Students who are feeling ill or experiencing symptoms such as sneezing, coughing, digestive issues (e.g. nausea, diarrhea), or a higher than normal temperature should stay at home and are encouraged to use the [UT Tyler COVID-19 Information and Procedures \(Links to an external site.\)](#) website to review protocols, check symptoms, and report possible exposure. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call (903) 566-7079 or email [saroffice@uttyler.edu](mailto:saroffice@uttyler.edu).

**Recording of Class Sessions**

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

**Course Website:**

Canvas will be used to manage the course material for the semester. There you will find homework assignments, HW/Quiz solutions, handouts, and other material pertaining to the class. The class lectures may be recorded and posted on canvas. **Please check canvas regularly.**

## **MEMORANDUM FOR STUDENTS ENROLLED IN CENG 4412 – Section 031**

SUBJECT: CENG 4412 (Reinforced Concrete and Steel Design) Administrative Instructions

1. Welcome to CENG 4412, Concrete and Steel Design. This course consolidates the fundamentals of Statics (ENGR 2301), Mechanics of Materials (MENG 3306) and Structural Analysis (CENG 3325), and applies them to the design of reinforced concrete and steel structural members and connections.
2. In this course you will learn to perform structural design as it is performed in engineering practice and you will be exposed to the engineering design process. In particular we will be focusing our efforts on using the American Institute of Steel Construction Manual of Steel Construction and the American Concrete Institute Building Code Requirements for Structural Concrete. You will be applying principles from previous math, physics, and mechanics courses throughout this course. You will work to maximize the use of your computer in support of your work. This course has 20 specific objectives (see Encl 1). They can be generally organized into two groups: (1) learning to internalize the engineering thought process by developing the ability to solve ill-defined, real world problems in a rational, systematic, and creative manner and presenting your solution in a clear and concise way; and (2) developing a working knowledge of structural concrete and steel design and incorporating the Load and Resistance Factor Design (LRFD) philosophy to examine problems with realistic constraints.
3. This class will meet online on Mondays, Wednesdays and Friday, 9:05-10:00AM. **If you miss a scheduled class, you are still responsible for the material.**
4. You are encouraged to seek additional instruction (office hours MWF 1:00PM-3:30PM online or by appointment). My goal is to be commonly available to you for assistance, so feel free to email me, my email address is [shuq@uttyler.edu](mailto:shuq@uttyler.edu). The best way to contact me is via email.
5. Class Room Procedures:
  - a. I will take daily attendance.
  - b. Bring study notes, **textbooks (AISC Manual or ACI Code)**, note-taking material, and calculator to every class. **You may not borrow or exchange calculators during graded events. If your calculator fails during a graded exercise, I am not responsible to furnish a substitute.** Class preparation is your individual responsibility.
  - c. Textbooks:
    - i. AISC Manual of Steel Construction, 15<sup>th</sup> Edition, 2017
    - ii. ACI Building Code Requirements for Structural Concrete and Commentary 318-19
    - iii. ASCE Minimum Design Loads for Buildings and Other Structures, 7-10, 3<sup>rd</sup> printing

**The Loads textbook (number iii above) is not required** –and I will offer handouts when appropriate.

Optional Books:

- i. Steel Structures: Design and Behavior by Salmon & Johnson, 5<sup>th</sup> Edition

- ii. Reinforced Concrete: Mechanics and Design by James K Wight and James G. MacGregor, 6<sup>th</sup> Edition
- d. You are not required to use colored pencils or a straight edge, but colors and straight lines can help with emphasis and clarity in your notes.
- e. I may have **announced and unannounced reading quizzes**.
- f. **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:
  - a. copying from another student’s test paper;
  - b. using, during a test, materials not authorized by the person giving the test;
  - c. failure to comply with instructions given by the person administering the test;
  - d. 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;
  - e. using, buying, stealing, transporting, or soliciting in whole or part the contents of an un-administered test, test key, homework solution, or computer program;
  - f. collaborating with or seeking aid from another student during a test or other assignment without authority;
  - g. discussing the contents of an examination with another student who will take the examination;
  - h. 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;
  - i. substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
  - j. 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;
  - k. falsifying research data, laboratory reports, and/or other academic work offered for credit;
  - l. 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

- m. 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.

**g. UT Tyler Resources for Students:**

- [UT Tyler Writing Center](mailto:writingcenter@uttyler.edu) (903.565.5995), [writingcenter@uttyler.edu](mailto:writingcenter@uttyler.edu)
- [UT Tyler Tutoring Center](mailto:tutoring@uttyler.edu) (903.565.5964), [tutoring@uttyler.edu](mailto: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 early-career courses.
- [UT Tyler Counseling Center](tel:903.566.7254) (903.566.7254)

6. Exams and Grading:

a. Grade Breakout and Cutoffs:

<u>Course Points</u>		<u>Grade Scale</u>
Mid-term Exams (3 * 10% =)	30%	A: 90% - 100%
Home Work / Quizzes	15%	B: 80% - 89%
Project – Cardboard Canoe	20%	C: 70% - 79%
Professional Practice	10%	D: 60% - 69%
Final Examination (Comprehensive)	25%	F: <60%

If you earn less than 65% on all Exams **or** if you fail to earn at least 50% on the Final you **may fail** the course, **regardless of your course grade**.

**\*\*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% of professional practice grade) plus participation in this course (35% of professional practice grade) plus ASCE student chapter activity. I will assign 30% percentage of the professional grade towards joining and attending a minimum of 2 ASCE meetings and submission of one mini report describing the meeting contents. I will provide a document template and an example of what needs to be submitted

**“If necessary, I reserve the right to adjust the grade scale at the end of the semester to your benefit”.**

b. Mid-Term Exams and Final Exam:

- 1) The dates for Mid-Term Exams are included in the course schedule. Official reasons for missing an exam are outlined in the “Student Handbook”. There will be no exceptions.
- 2) Mid-Term and the Final Exam are closed notes. The ONLY references for these exams are *your own personal* copies of the AISC Manual for Steel Construction, and ACI Building Code Requirements, and a calculator. You may not use another individual’s AISC or ACI 318 manual. *You may (and must) tab your manual to aid in navigating this large document. You may NOT attach additional sheets to the manual.*
- 3) Laptops/PDAs/MP3 players/Cell Phones/Smart Watches 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:
<b><u>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.</u></b>	

## Calculator policy

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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 **2021 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.)

c. Collection of Student Work:

Throughout the semester I will 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.

d. Embedded indicators of accomplishment of program outcomes:

At times throughout the semester, portions of student work will be analyzed to determine if our program is accomplishing stated program outcomes based on established metrics. **If your work is below the minimum established metric, you will be required to repeat the assignment or that portion of the assignment until you achieve the minimum acceptable standard based on the metric.**

7. Homework:

**All homework is mandatory and becomes part of your grade, failure to submit any required homework on time will result in a grade of zero.** As an engineer your goal is to make a clear, logical, and professional presentation of your work, which is both accurate and correct. As such both your presentation and the accuracy of your work is important, and both will be graded. It is critical that you show all of your work and leave “foot prints” so that it can be easily followed. No guess work should be required to see what you did. **All submissions are due on the due date via Canvas, no email submission will be accepted.** Additional guidance:

a. Problem Sets (PS)

- 1) Include a title sheet.
- 2) **Use engineering paper or full-page printouts from Mathcad, Excel, Visual Analysis, etc.** You may neatly tape or glue short computer printouts onto engineering paper at the appropriate place in the logical flow of the problem. Only use one side of a page. Clearly present a **brief problem statement and a sketch** with your solution. Clearly and concisely explain each step. For narratives of more than a line or two, use your word processor or the text capability if you are using MathCAD or Excel. If you are writing out a paragraph or more, you must type it.
- 3) All homework in this course must be properly documented. As you are having your work reviewed it is likely that you might receive help from your classmates, just simply document it. Information from the course textbooks (equations and outlines of procedures), class notes, or me is considered immediately available to all students and need not be acknowledged or documented with one exception. If an equation from your AISC Manual is used, please provide the equation no. and page no. in brackets [ ] beside its first use. This will help you as you study from your homework at a later date. **YOU ARE REQUIRED TO ACKNOWLEDGE AND DOCUMENT ALL OTHER ASSISTANCE AND REFERENCES USED.** Documentation will be accomplished in accordance with any manual for writing, footnote or endnote, for papers, but for written homework, just place the documentation right at the point you received help using “Who and what” assistance.

b. Engineering Design Problem:

This course includes a semester long design problem with a series of submissions along the way. When submissions are complete you will have executed a complete design for a structural system. More information will be provided

c. **Assigned readings:**

Doing the assigned reading prior to class will help you to understand the material presented during the instruction and will fill in gaps for things we do not cover (***I may not be able to cover everything***). It will also make you more familiar with terms and concepts to be covered. To help motivate you to do the reading there may be quizzes that you are required to complete prior to class on many readings, and/or announced and unannounced quizzes during class.

8. **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>

9. **Grade Replacement/Forgiveness and Census Date Polices:** Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar. Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

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

10. **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 census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

11. **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 Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities.. If you have a disability, including a non-visible 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 Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. 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.
12. **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.**
13. **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.
14. **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.
15. **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.
16. **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](http://www.uttyler.edu/tobacco-free).

17. 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>.

Encls 1) Course Objectives

Sincerely,  
Shariful Huq

### **CENG 4412 Concrete & Steel Design - Course Objectives:**

1. Given a set of functional requirements and an architectural concept, design a low-rise structural steel or concrete building.
2. Describe the characteristics and behavior of structural steel.
3. Describe the advantages and disadvantages of using structural steel as a building material.
4. Describe the advantages and disadvantages of using reinforced concrete as a building material.
5. Explain and apply the stages/phases of the engineering design process model.
6. Perform a load analysis using ASCE 7-10 for dead load, live load, snow load, roof live load, and wind load.
7. Use the LRFD load case combination equations to develop load case combinations for structural analysis.
8. Apply the LRFD methodology:  $\phi R_n \geq \sum \gamma_i Q_i$
9. Model braced and rigid frames as lateral load-resisting systems.
10. Reduce a real-world 3 dimensional frame to a 2 dimensional model, accounting for the applied loads, connected members, and out of plane behavior.
11. Analyze and design a structural steel tension member assembly (tension member and connecting element).
12. Analyze and design a structural steel compression member.
13. Analyze and design a structural steel beam and girder.
14. Analyze and design a structural steel beam-column.
15. Analyze and design a reinforced concrete beam.
16. Analyze and design a reinforced concrete column.
17. Analyze and design a reinforced concrete beam-column.
18. Analyze and design a reinforced concrete slab.
19. Use modern engineering software to solve problems.
20. Function effectively as a member of a design team.