

University of Texas at Tyler - Department of Civil Engineering
CENG 3434 Civil Engineering Materials, Codes and Specifications
Fall 2021

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

Lectures:
TuTr 2:00 PM - 3:20 PM

Laboratory:
TuTr: 3:30PM-6:15PM
HEC D113 and D114 (Civil Engineering Lab in back of building along Meadowglen)

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.

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. Collected homework graded for completion only. The class lectures may be recorded and posted on canvas. Please check canvas regularly.

Catalog Description:

Physical properties of typical construction materials will be investigated including steel, Portland cement concrete, wood, and possibly bituminous asphalt; classification of aggregates, concrete mix design, and field control and adjustment. Application of model building codes to commercial and industrial structures; non-structural and structural plan review; fire codes, inspection techniques.

Learning Objectives:

1. Explain the properties of materials commonly used in civil engineering.
2. Explain the fabrication or method of manufacture of civil engineering materials.
3. Explain and apply the testing methods commonly used on civil engineering materials.
4. Explain and apply the standards covering the manufacture of civil engineering materials and the testing methods commonly used on these materials.
5. Explain and apply codes, standards and specifications commonly used in civil engineering.
6. Expose the students to the requirement for written presentation of their work.
7. Conduct experiments on civil engineering materials according to the appropriate laboratory procedures.

Prerequisites:

CENG 3306 or MENG 3306: Mechanics of Materials

Required Texts:

Civil Engineering Materials, 2nd Ed, by Shan Somayaji, Prentice Hall, ISBN: 0-13-083906-X

Schedule (Tentative and Subject to Change):

Lesson No.	Date	Topic	Lesson Material (Textbook) Chapter #/Section #
Week 1			
	8/23	No Lab - First Week of Class	
1	8/24	Material types, properties and standards for testing and design	Chapter 1
2 and 3	8/26	Aggregates; Sampling and particle size distribution	2.1-2.3.3; 2.3.4
Week 2			
	8/30	No Lab Week	
4	8/31	Concrete and Cement - Part 1	3.1-3.1.1, 3.3-3.4.2, 3.5
5 and 6	9/2	Concrete and Cement - Cement Behavior and Composition; Properties of Good Concrete	3.4.3-3.4.6; 3.5-3.7
	9/3	CENSUS DAY	
Week 3			
	9/6	LABOR DAY - No Class	
Lab 1	9/7 & 9/9	Aggregate: Moisture Content, Unit Weight, Sieve Analysis, Absorption Capacity	AGG-1,AGG-3,AGG-7
7	9/7	Concrete Properties - Field Testing and Curing	3.7-3.7.4
8	9/9	Properties of Hardened Concrete	3.8-3.8.5
Week 4			
Lab 2	9/14 & 9/16	Tension Test of Metals	-
9	9/14	Concrete Properties, Creep and Shrinkage	3.8.6-3.9.4
10 and 11	9/16	Concrete Mix Design; Concrete Types & Ch. 19 IBC	3.10; 3.11-3.13, IBC 19
Week 5			
Lab 3	9/21 & 9/23	Making Concrete: Batching, Mixing, Slump Test, Construct Concrete Cylinders	CON-1,CON-2,CON-3,CON-4
12	9/21	Introduction to Steel	7-7.2
13 and 14	9/23	Steel Types and Properties; Structural Steel	7.2-7.3; 7.4-7.4.1
Week 6			
Lab 4	9/28 & 9/30	7 Day Concrete Strength Test	CON-3
15	9/28	Reinforcing Steel	7.5-7.7
16 and 17	9/30	Laboratory Strength Test of Steel; Introduction to Masonry	Cordon Book; 4-4.1.3
Week 7			
	10/4	No Lab Week	-
-	10/5	EXAM 1	-
18 and 19	10/7	Properties and Size of Masonry Units; Mortar and Grout	4.1.4-4.1.8; 4.2-4.2.3, 4.2.4
Week 8			
Lab 5	10/12 & 10/14	Construct Masonry Prisms	MAS-3,MAS-5
20 and 21	10/12	Masonry Construction; Properties of Masonry	4.3.1; 4.3.2-4.5
22	10/14	Introduction to Timber	5.1-5.3.3

Week 9			
Lab 6 Lab 7	10/19 & 10/21	7 Day Masonry Prism Crush Test 28* Day Compressive Strength of Cylinders	CON-3 / MAS-8
23 and 24	10/19	Defects, Deterioration, and Shrinkage of Wood; Classification of Wood for Construction	5.3.4-5.5.1; 5.9-5.9.1
25	10/21	What Happened? Failure Modes of Wood	5.6-5.8.2
Week 10			
Lab 8	10/25	High Strength Concrete Lab	-
26 and 27	10/26	Wood Products; Wood Construction and Load Path	5.9.2, 5.10-5.10.2; 5.10.3-5.12
28	10/28	Wood Testing	Cordon, IBC 23
Week 11			
	11/1	LAST DAY TO WITHDRAW FROM CLASSES	
Lab 9	11/2 & 11/4	Timber Lab: WOOD 2, 3, 4	WOOD-2, WOOD-3, WOOD-4
29, 30 and 31	11/2	IBC Chapters 2 and 3: Occupancy Classification; IBC Chapter 6: Construction Types; IBC Chapter 5: General Building Height and Area	IBC Chapters 2 and 3; IBC Chapter 6; IBC Chapter 5
	11/4	EXAM 2 - Review	
Week 12			
Lab 10	11/8	IBC Chapter 5 and 6 Lab	-
-	11/9	EXAM 2	-
32, 33	11/11	ASTM Overview; Asphalt Types	PowerPoint; 6.2-6.4
Week 13			
Lab 11	11/15	IBC Chapter 11 Lab	-
34 and 35	11/16	Properties of Asphalt; HMA and Flexible vs. Rigid Pavements	6.4-6.5.3; 6.6-6.7.2
36	11/18	IBC Chapter 10: Means of Egress	IBC 10 (PowerPoint)
Nov 23 – 27		Thanksgiving Week – No Class	
Week 14			
	11/29	Final Week	-
37 and 38	11/30	Plastics; TBA	Chapter 8
39	12/2	FE Review Video	-
Week 16			
-	Week of 12/6	FINAL EXAM (Date TBD)	

Exams:

There will be 2 midterm examinations (held during the scheduled class time) and one final examination. The exams are **TENTATIVELY** scheduled for:

Exam 1: October 7th
Exam 2: November 11th
Final Exam: TBD

Exams dates may be moved up or pushed back depending on the progress of the lectures. You can use a NCEES approved calculator and also instructor approved reference material. **Solutions to exams will NOT be posted. No make-up exams will be given except for medical or other**

similar hardships where advanced arrangements are made with the instructor; or in case of non-selective medical emergencies with appropriate physician's note or documentation. Other than circumstances described above, failure to take the exam at the scheduled time will constitute a grade of zero in the exam.

Homework:

Homework will be assigned on a regular basis. **To receive full completion grade - Homework must be uploaded in canvas by the due date and time.** No late homework will be accepted except when arrangements are made with the instructor ahead of time. Solutions will be posted on canvas. Homework should be typed or clearly hand written with the question in **bold** and the answer unbolded as shown below. For example:

1. **List the three main components of concrete**
Aggregate, water and cement

Homework Submission Guidelines (Professionalism Requirements):

1. Homework should be submitted using letter size (8 ½ x 11") paper. Engineering paper is preferred but plain graph paper is allowed if you do not have access to engineering paper.
2. A title page should be included with the following:
 - a. Name of Student
 - b. Student ID
 - c. Course Number and Name
 - d. Homework Number
3. The second page should be a written or typed summary of the assignment. This should include:
 - a. The type of problems being worked.
 - b. The principles and assumptions present in the equations used.
 - c. The applications and types of members these tools may be used for.This summary should be one or two paragraphs, written in your own words.
4. 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.
5. Multiple sheets should be stapled at the top left corner of the page.
6. The submitted papers should be free of frail edges, stains, smudges and wrinkles.
7. All problems should include:
 - a. Problem Number
 - b. A diagram of the problem (draw all free body diagrams when necessary) -drawn by hand, do not simply photocopy problem from textbook.
 - c. A set of given quantities
 - d. A set of unknown quantities
 - e. A set of assumptions
8. All numbers and writing should be clear and readable.
9. When required to produce a graph, use a computer program such as excel or matlab to generate the plot. Do not draw it by hand!
10. The **final answer should be boxed** and at the bottom of the problem.

Laboratory:

There will be a series of labs completed during the semester. We will meet for lab on **Tuesdays and Thursdays at 3:30PM-6:15PM in room D113 and D114**. At the first lab, we will go through proper safety training. You will be required to sign a student safety contract prior to beginning of lab sessions. Everyone is required to abide by the safety contract during the semester. Failure to follow proper procedures during a lab will result in a zero grade for that particular lab assignment.

Be sure to review the handout and complete all required work prior to coming to lab. This will help to prepare you for the experiment and help to make the sessions run smoother. If necessary a quiz will be given at the beginning of the lab which covers the experiment for the day.

You will work in groups to complete each lab. The instructor will assign the groups or let students choose their groups. Each group will be required to turn in one report for the entire group. The format for the report is provided with the syllabus. You are encouraged to visit the writing center, as they can provide excellent feedback and help you with your writing.

Grades:

Homework/Quizzes = 15%
Professional Practice = 10%
Midterm Exams (2*15%) = 30%
Final Exam = 25%
Labs= 20%

Grade Scale:

A: 90-100
B: 80-89
C: 70-79
D: 60-69
F: <60

****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”.

Final day to withdraw:

The final day to withdraw from the course without penalty is **November 1st**

Census dates:

The university requires that instructors to report the attendance to the register at various points in the semester. Therefore, on **September 3rd** I will be taking attendance. Please make sure you are there for class on that date or notify ahead if you will not be there.

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 early-career courses.
- [UT Tyler Counseling Center](http://www.uttyler.edu/counseling) (903.566.7254)

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.

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.php>

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 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.)

Grade Replacement/Forgiveness and Census Date Policies: 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

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.

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

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:

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, quitlines, and group support. For more information on cessation programs please visit www.utt Tyler.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.utt Tyler.edu/about/campus-carry/index.php>.

Prepared by: Shariful Huq
Lecturer
Department of Civil and Environmental Engineering

CE 3434 General Requirements for Laboratory Reports

Lab Time:

Tuesdays and Thursdays at 3:30PM-6:15PM in room D113 and D114

A laboratory report is required for each experiment performed. Only one lab report is required per group for most labs. There may however be certain labs that require each person to submit their own work. Due dates for each lab will be posted. Each group will need to submit one paper copy of the lab as well as upload a copy to blackboard. The report should be in the following format.

- **Cover Page:** Laboratory Title, Course Number (CENG 3434), Your Names and Group Number. Each person in the group sign the cover page indicating that they have read the report and approve of the contents contained within.
- **Objective:** Purpose of the experiment should be explained in a few sentences.
- **Procedure:** Include a summarized procedure of the steps you took to complete this lab. Numbered list is preferred.
- **Results and Discussion:** Present tabulated raw data (data sheets are provided with the standard laboratory procedure), relevant calculations, and required plots. **BE SURE TO USE CAPTIONS FOR FIGURES, TABLES AND GRAPHS!** Refer to the figures, graphs and tables by number in the text of the discussion. Partial credit can only be assigned if you present your work in a logical manner. Neatly show your work and attach a page of sample calculations.
Try to have a good understanding of each experiment. Analyze your results. Identify probable sources of error that may have occurred while you performed the laboratory, and explain that how these errors might affect your results (final value will increase or decrease). **DISCUSS!!** For example, what trends do you notice in the data? Do the results make sense? Are they what you expected? If so why? If not, why not? Some labs will have more data than others to discuss. Be sure to give a thorough discussion of your results.
- **Conclusions:** Summarize your results. Relate what you have learned from class about materials, codes and specs to what you have learned from performing this lab. Explain that how this experiment is useful to solve the practical civil engineering problems.
- **Team Contributions:** The contributions of each team member should be stated in this section. List what portions of the report each person contributed towards and how much time each person spent. It is okay to have multiple people working on any part.

GRADING

Participation in Lab and Cleanup	20 %
Report	
• Objective	5 %
• Procedure	10%
• Results and Discussion	40 %
• Conclusions	25 %

Sign-in/Sign-out:

For each lab you will be required to sign in and out to receive the 20 percentage points for participation. You will not be allowed to sign out until the lab space is clean and all equipment has been returned to its appropriate place. We will be sharing this lab with another class this semester so it is important to keep the lab clean.

THINGS TO REMEMBER

- After finishing the experiments, clean the instruments and the work area.
- Data sheets should be typed in Excel
- Sample calculations can be typed or written neatly on engineering paper and placed as an appendix of the report. The remainder of the report should be typewritten.
- When writing your reports, avoid using first person like “I” or “we”.

USE CAPTIONS FOR FIGURES AND TABLES! REFER TO THESE FIGURES AND TABLES SPECIFICALLY IN THE TEXT USING THE FIGURE/TABLE NUMBER!!