University of Texas at Tyler - Department of Civil Engineering
CENG 3434 Civil Engineering Materials, Codes and Specifications
Fall 2019

Instructor: Shariful Huq
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Office Hours:
MW 1:00PM-3:00PM; Th 1:00PM-3:00PM
Or by Appointment
HEC Room A204

Lectures:
TR 3:30PM-5:00PM HEC Room B210

Laboratory:
Tuesdays: 5:15APM-8:00PM
Saturdays: 9:00AM-11:45AM
HEC D113 (Civil Engineering Lab in back of building along Meadowglen)

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. **Please check there 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
		Week 1	
	8/26	No Lab - First Week of Class	
1	8/27	Material types, properties and standards for testing and design	Chapter 1
2	8/29	Aggregates; Sampling and particle size distribution	2.1-2.3.4
		Week 2	
	9/1	Labor Day Week	
4	9/3	Concrete and Cement - Part 1	3.1-3.1.1, 3.3-3.4.2, 3.5
5	9/5	Concrete and Cement - Cement Behavior and Composition	3.4.3-3.4.6
		Week 3	
	9/8	In-Lab Lecture Period	
6	9/10	Properties of Good Concrete	3.5-3.7
7	9/12	Concrete Properties - Field Testing and Curing	3.7-3.7.4
8	9/14	Properties of Hardened Concrete	3.8-3.8.5
		Week 4	
	9/17	**HCC CLOSURE: TROPICAL STORM - IMELDA**	
9	9/17	Concrete Properties, Creep and Shrinkage	3.8.6-3.9.4
10	9/19	Concrete Mix Design	3.10
11	9/21	Concrete Types, Ch. 19 IBC	3.11-3.13, IBC 19
		Week 5	
Lab 1	9/24	Aggregate: Moisture Content, Unit Weight, Sieve Analysis, Absorption	AGG-1,AGG-3,AGG-7
12	9/24	Introduction to Steel, Steel types and properties	7.1
13	9/26	Steel types and properties	7.2-7.3
14	9/28	Structural Steel	7.4-7.4.1
		Week 6	
Lab 2	10/1	Making Concrete: Batching, Mixing, Slump, Air, Cylinders	CON-1,CON-2,CON-3,CON-4
15	10/1	Reinforcing Steel	7.5-7.7
16	10/3	Laboratory Strength Test of Steel	Cordon Book
17	10/5	Introduction to Masonry	4-4.1.3
		Week 7	
Lab 3	10/8	7 Day Concrete Strength Test	CON-3
18	10/8	Properties and Size of Masonry Units	4.1.4-4.1.8
19	10/10	Mortar and Grout	4.2-4.2.3, 4.2.4
20	10/12	Masonry Construction	4.3.1
		Week 8	
Lab 4	10/15	Metal Tension Test	
-	**10/15**	**Exam 1 - In Class**	-
21	10/17	Properties of Masonry	4.3.2-4.5
22	10/19	Introduction to Timber	5.1-5.3.3
		Week 9	
Lab 5	10/22	**Construct Masonry Prisms**	**MAS-3,MAS-5**
23	10/22	Defects, Deterioration, and Shrinkage of Wood	5.3.4-5.5.1
24	10/24	Classification of Wood for Construction	5.6-5.8.2
25	10/26	"What Happened?" Failure Modes of Wood	5.9-5.9.1
		Week 10	

Lab 6 Lab 7	10/29	**7 Day Masonry Prism Crush Test 28 Day Compressive Strength of Cylinders**	**CON-3 / MAS-8**
26	10/29	Wood Products	5.9.2, 5.10-5.10.2
27	10/31	Wood Construction and Load Path	5.10-5.12
28	11/2	Wood Testing	Cordon, IBC 23
		Week 11	
Lab 8	11/5	**High Strength Concrete Lab**	-
29	11/5	IBC Chapters 2 and 3: Occupancy Classification	IBC Ch. 2 and 3
30	11/7	IBC Chapter 6: Construction Types	IBC Chapter 6
31	11/9	IBC Chapter 5: General Building Height and Area	IBC Chapter 5
		Week 12	
Lab 9	11/12	Timber Lab: WOOD 2, 3, 4	WOOD-2,WOOD-3,WOOD-4
-	11/12	Exam 2 - In Class	-
32	11/14	ASTM Overview	Powerpoint
33	11/16	Asphalt Types	6.2-6.4
		Week 13	
Lab 10	11/19	IBC Chapter 5 and 6 Lab	
34	11/19	Properties of Asphalt, HMA and Flexible vs. Rigid Pavements	6.4-6.5.3
35	11/21	HMA and Flexible vs. Rigid Pavements	6.6-6.7.2
36	11/23	IBC Chapter 10: Means of Egress	IBC 10 (powerpoint)
Week 14 - 11/25 through 11/29 Thanksgiving Break - No Class			
		Week 15	
Lab 11	12/3	IBC Chapter 11 Lab	
37	12/3	Plastics	Chapter 8
38	12/5	TBA	
39	12/7	FE Review Video	
		Week 16	
	-	**FINAL EXAM - 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 15th
Exam 2: November 12th
Final Exam: TBD

Exams dates may be moved up or pushed back depending on the progress of the lectures. You can use a calculator and 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. **Homework must be turned is at the beginning of lecture on the due date**. No late homework will be accepted except when arrangements are made with the instructor ahead of time. Solutions will be posted on blackboard. Homework

should be typed with the question in **bold** and the answer un-bolded 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 at 5:15PM-8:00PM and Saturdays at 9:00AM to 11:45AM in room D113. 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 of 5 or 4 to complete each lab. The instructor will assign the 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:	**Grade Scale:**	
Homework/Quizzes = 15%	A:	90-100
Professional Practice = 10%	B:	80-89
Midterm Exams (2) = 30%	C:	70-79
Final Exam = 25%	D:	60-69
Labs= 20%	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:
Your professional practice grade will be computed based upon your attendance, the number of assignments you submit, the quality of your work and your participation in class.

Final day to withdraw:
The final day to withdraw from the course without penalty is **November 4th**

Census dates:
The university requires that instructors to report the attendance to the register at various points in the semester. Therefore, on **September 9th** 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.

Academic Misconduct: Plagiarism of homework and cheating on examinations will be interpreted as academic misconduct and will not be tolerated. Please refer to the University of Texas at Tyler current Undergraduate Catalog for academic policies and Manual of Policies and Procedures for Student Affairs (MOPPS, Chapter 8) regarding academic integrity, cheating and plagiarism. Academic dishonesty will not be tolerated. Ignorance of the rules and policies provides no protection from the consequences.

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, www.ncees.org/exams/calculator-policy/. Examples include but are not limited to:

  - Hewlett Packard – HP 33s, HP 35s, and no others
  - Casio – All FX 115 and FX 991 models
  - Texas Instruments – All TI 30X or TI-36X models.
  - If you are unsure about your calculator, it is your responsibility to check with the instructor for approval.

  At the discretion of the course instructor, any calculator not meeting the requirements stated (especially in the case of a graphing calculator) may be used but only after an inspection of the device and a clearing of all the memory within the device, performed for the instructor at a time immediately prior to the exam. At any time during the exam your calculator is subject to a random search by the instructor. Failure or refusal to clear all memory or to surrender your calculator to search will disqualify you from the exam immediately, unless you can produce a calculator meeting the requirements as stated above.

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

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. 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 Services: In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University offers accommodations to students with learning, physical and/or psychiatric disabilities. If you have a disability, including non-visible disabilities such as chronic diseases, learning disabilities, head injury, PTSD or ADHD, or you have a history of modifications or accommodations in a previous educational environment you are encouraged to contact the Student Accessibility and Resources office and schedule an interview with the Accessibility Case Manager/ADA Coordinator, Cynthia Lowery Staples. If you are unsure if the above criterion applies to you, but have questions or concerns please contact the SAR office. For more information or to set up an appointment please visit the SAR office located in the University Center, Room 3150 or call 903.566.7079. You may also send an email to cstaples@uttyler.edu

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, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Concealed Handgun Policy

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 .

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

CE 3434 General Requirements for Laboratory Reports

Lab Time:
Tuesdays at 5:15PM-8:00PM and Saturdays at 9:00AM to 11:45AM in room D113

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 indicting 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!!**