

CMGT 3310

Spring 2024

Welcome to Construction Structural Systems I:

In this course we will study the effects of forces, moments, and couples acting on stationary structures; equilibrium in 2/3-D; free-body diagrams; centroids and moments of inertia; stress and strain; uniaxially loaded members; torsion.

We will meet *every Mon, Wen, and Friday* from 9:05 to 1000 AM in Room RBS 1031

1. *Engineering is a cumulative discipline. What we learn early in CMGT 3305 is the basis for what we will learn in CMGT 3310. Engineering is always building upon the foundation that was just laid in earlier material!*

This semester is building on the intro to building system in CMGT 3305 and you will find our study of Construction Structural Systems in 3310 will give you the *basic engineering and design critical skills* you will use for the remainder of your professional careers in construction engineering.

2. We will meet according to the course schedule shown on last page which also includes the course topics.
3. The following are course competencies you will be evaluated on your ***knowledge and practice*** of key:

Problem Solving (Critical Thinking)—the student will use lecture and demonstration to foster conceptual thinking skills, drawings, bid proposals and learning project standards and specifications.

Personal Accountability for Achievement—the student will complete the assigned projects at the time designated by the instructor and will demonstrate on both exercises and exams that he has learned the material presented.

Demonstrated Competence in Engineering and Technology Principles Competence in construction and engineering principles and in the application to construction management processes and practices.

Course Objectives:

1. Understand the basic principles of engineering mechanics.
2. Apply these engineering mechanics principles to building systems problems
3. Be able to use Free Body Diagrams in analysis of problems.
4. Understand the concepts of Stress, Strain, and Thermal Changes on the strength of materials.
5. Understand and solve for the centroid and Moment of Inertia at any point in any structural element.
6. Understand the concept of the Radius of Gyration in a structural member.
7. Determine the internal forces in a structural element under loads (axial, shear, moment, torque)

SCHEDULE: IAW the course schedule (see Encl 1). There are 41 lessons this semester – each an *hour long* – and each lesson contains lot of material that builds on the material from the previous class –staying up on reading and homework is critical –we make big jumps each class in knowledge and practice!

- a. Being present and engaged is a critical CM *professional* service attribute! If you MUST miss a scheduled class, you are still responsible for turning in the homework assigned for that day (send to me by email) and the material covered in class. NOTE: ***you will not get the participation points for an unexcused absence and any grade for that day (Quiz) for the lesson.*** ***NOTE if one is given will be a 0.***

Note: Just like a real job –showing up to class on time is a real world obligation – there are no free missed classes. Just like the real jobs that many of you have -- **We expect you to be on time and ready when class starts.** If you come late you must see me the end of class and explain why you were late. If you **come into class after we start the lecture** I may ask you to not enter the class and not disrupt the quiz, project, or lecture. You will get a ZERO for that class and exercise if you do not have a valid excuse for your tardiness. Normally an excuse would be given for being late or missing that class if you have a valid verified urgent emergency or some validated significant act of nature or God like a car accident. It is also possible in extenuating circumstances to have A “COORDINATED LATE” submission that can occur when you contact me in advance. (That means 24 hours in advance except for real emergencies). In this case I will set up another time for you and I to review the class material missed.

ASSISTANCE and EXTRA HELP - I am in my office every day -- always feel free to come by to see me in my office – BEST PRACTICE is to **email me ahead of time** to set up an appointment for when you would like to meet. My office hours are posted on my office door, RBS 1037.

1. Class Room Procedures: BE ON TIME!

- a. Bring study notes, **textbook**, note-taking material, and calculator **to every class**. Class preparation is your individual responsibility.

In engineering we use the “professional’s” learning model – **self: read, study, apply** –THEN discuss details and review items of concern (what you did not understand properly in practice) in the next day’s class –**WE DO NOT TEACH the assignment in Lecture!**

Note: I will often pick someone at random at the start of class to show how they accomplished any homework problems due that day – so be ready and be prepared.

- b. **NO ELECTROIC DEVICES are to be used in class EXCEPT your calculator** – no exceptions –that means no cell phones, no computers, no ipads, no smart watches, etc – there is no material and tasks covered in this class that will require technology to accomplish them. ALL DEVICES are to be off and stowed away at start of class.

- 2. **Mandatory Textbook:** *Statics and Structural Strength of Materials for Architecture and Building Construction* (4th Ed.) by Barry Onouye and Kevin Kane (ISBN 978-0-13-507925-6)

DO NOT GET the “INDIA VERSION ON AMAZON”

- 3. **Final Grade Weighting Scale:**

| Course Points | Grade Scale |
|----------------------|--------------------|
|----------------------|--------------------|

Your final grade is made up according to this weighting scale.

| | |
|---------------------------------------|--------------|
| Hour Exams (5 at 100 each) | (80 %) |
| Wood Stand Project | (10%) |
| Prof Practice and Unannounced Quizzes | <u>(10%)</u> |

100%

Letter Grade Scale: A= 90 to 100
B = 80 to 89
C = 70 to 79
F = below 70

Wood Stand project due last day of class – info in Modules

Note: I reserve 10% of the grade for Professional Practice Grade *participation grades*. This is **purposefully large enough** to impact your total weighted course grade – maybe by one whole letter grade. Students who desire to be awarded the full 10% are expected to:

1. **Attend ALL** classes and **BE ON TIME**
2. **Participate** in discussions,
3. **Answer questions** presented in class (think QUIZ!!!)
4. **Seek help** (if necessary) outside the class – attend any tutorials or test prep classes
4. **Be responsible** for all material and announcements discussed in class.

Note: *If you get less than 70% (C) as your final combined grade you will “fail” the course.*
Remember **you need a C or better** in a core major class to move on to the next course.

Note: Your final grades **are only A, B, C, D, F** -- We DO NOT “up” a grade if you are close to a B or an A! Your final average IS your final weighted average and is a result of the weighted grade not the raw average.

You will always know where you stand for your grade. *I will return all graded exercise to you quickly – keep track of them – I will also post grades in Canvas so can see what your cumulative grade looks like. If you do not agree with a posted grade see me ASAP –right after they are posted. DO NOT bring a disputed grade to me if that grade has been posted for more than 14 days. DO NOT wait till the last week of the course to talk about how to improve or salvage a poor grade. This is a cumulative process – not a single event.*

Note: *There is no way to ADD to your grade once an exercise is graded –the cumulative grade is the FINAL grade – there are NO adjustments made at end of course*

4. Exams:

- a. The dates for Exams are included in the course schedule. Official reasons for missing an exam include official University participation, family emergency or other unforeseen circumstance. Regardless of the reason you are required to notify the instructor **prior to the exam** and as early as feasible. ***IF you are not present at the start of the exam you will receive a 0 –there are no late starters for an exam –the class room is closed once an exam starts! There are no bathroom breaks allowed once exam begins –so be prepared and forewarned!***
- b. All the Exams and the Final and are **closed book**. Depending on the amount of equations covered in any block of instructions I **may allow** a single 3 by 5 inch note card for an exam –I will let you know in advance if this applicable to an exam –**assume none is allowed unless I direct otherwise.**

- c. The ONLY electronic device allowed in an exam is an approved calculator. If you are caught cheating, walk out of the classroom without handing in your exam or using a non-approved electronic device/calculators, or use non authorized note material during the exam your exam will be collected and *your grade will be a zero.*

Note: As an engineer your primary means of communication is thru written plans, calculations, and memos. It is an absolute imperative that engineers be able to make a clear, logical, and professional presentations of your work, which is both easily followed, accurate, complete, and correct. This skill starts with your exams and quizzes in this class. Every problem must have:

ALL Equations you will use for the problem must be included at the START of the calculations –no equation = NO CREDIT!

ALL WORK MUST BE SHOWN TO BE CONSIDERED FOR CREDIT – a final answer only does not count as full credit – credit is given for degree of work shown! –problems with only a final answer are graded as a 0!

Every problem solution begins with the generic equation selected to be used in its basic form and then all steps are shown to the final answer

Flow of solution must be clear and laid out in easily followed steps of completion.

If your work and the final answer does not match the grade is a 0!

Your writing must be legible, readable, and complete with UNITS!

All final answer must be marled as “ANS” – numbers without the solution labeled will NOT be considered for grade even if present and unlabeled

ALL answers must be complete to include final units!

Remember: It is not my task to search for your answers in a problem!

NOTE: an exam is an assessment of your ability to understand, design, and propose a solution to a given problem. I will not make any assumptions or fill in the blanks for your answer. The solution is either complete or incomplete –if incomplete it will be graded as a partial answer with a grade proportional to my rubric of completeness! There is no form of debate or rebuttal to my grading of a problem. My grade is final.

You will not be given a graded exercise back for you to keep a copy of. You are not authorized to make copies of any exam nor should you share or be in possession of any prior exams or quizzes! Possession of or use of prior exam material is considered an HONOR CODE violation in 3310! You will be given and honor code statement to this effect before each exam!

6. Homework: IF Homework problems when assigned are due at the start of class. There is no such thing as late homework. If I DECIDE to pick up the homework assignments at the start of a class. *I may grade* various homework assignments.

Homework is an assessment of your ability to self-learn and study the material. As a construction engineer you have an on-going responsibility to the profession to continually learn. The lecture model you are most familiar with is not how professionals learn. We are capable of self-study and learning. Your homework is a measurement of your ability to learn key principles on your own. It is a vital skill to master. You cannot rely on the lecture and classroom to learn the material. It is a good tool to help get over specific principles that are stumping you. But this should be the exception.

You should be able to read and solve the material BEFORE you come to class.

All homework is **mandatory** and *if graded* becomes part of your grade and failure to submit any required homework will result in a 0 for that exercise.

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. If you are repeating this course for a grade replacement, you must file an 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.

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 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.

11. Disability Services. In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Support Services counselor. If you have a disability, including a learning disability, for which you request an accommodation, please contact Ida MacDonald in the Disability Support Services office in UC 282, or call (903) 566-7079. **You MUST contact me for accommodation needs. I will not contact you first.**

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 in advance for an excused absence and late submission of work.

13. Student Absence for University-Sponsored Events and Activities. If you intend to be absent for a university-sponsored event or activity, you and the event sponsor request must notify me at least two weeks prior to the date of the planned absence.

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.

Encls 1 Joe Boylan CMGT 3310
Attachment 1

2024 Initial Course Schedule (Subject to change as needed throughout the semester)

| Date | Lesson | Materials Covered | Assigned Reading | Homework Assignments |
|-----------|--------------|---|----------------------|--|
| 1/17 | 1 | Course Syllabus and Course Objectives & Review of Reaction Forces and Equilibrium in Static Structures. | Pg 1 - 89 | Prob 2.42, .43,.46, .50,.52,.53,.55,.57,.58, .60 |
| 1/19 | 2 | Cable Systems Example 3.3 | 98-106 | 3.1, 3.2 |
| 1/22 | 3 | Distributed Load | 111-118 | 3.5, 3.6 |
| 1/24 | 4 | " | | 3.8,.9,.10 |
| 1/26 | 5 | Trusses and Analysis by Joints EX 3.7 | 119-129 | 3.12,.13 |
| 1/29 | 6 | " | | 3.15,.16 |
| 1/31 | 7 | Truss Analysis by Sections | 139-144 | 3.18,.19,.20 |
| 2/2 | 8 | Zero Force members in a structure | 150-152 | 3,25,.26,.27 |
| 2/5 | 9 | Pinned Frames EX 3.15 | 153-160 | 3.31 |
| 2/7 | 10 | Retaining Walls | Pg 175-184 | EX 3.19 3.20 |
| 2/9 | 11 | Retaining Walls | | EX 3.21- 3.233.59-3.60,3.61 |
| 2/12 | 13 | TEST #1 | Chapter 3 | |
| 2/14 | 14 | Stress and Strain/ Thermal | 251 -261 | 5.1,.2,.3,.4 |
| 2/16 | 15 | Deformation and Strain | 264 - 266 | 5.7 5.8 |
| 2/19 | 16 | Thermal Effects on materials | 289 - 293 | 5.16, 5.18 |
| 2/21 | 17 | Centroids | p300-309 | 6.1, .3, .4 |
| 2/23 | 18 | Centroids | | 6.5 |
| 2/26 | 19 | Centroids & | | |
| 2/28 | 20 | MOI | P 311-323 skip p 317 | 6.6 .7, .12,.13 |
| 3/1 | 21` | MOI | | 6.12, .13 |
| ¾ | 22 | Radius of Gyration and Review | P329-330 | Know example 6.12 |
| 3/6 | 23 | Test #2 | | |
| 3/8 | 24 | Moment and Shear in a Beam | Pg330-345 | 7. 1,.2,.3,.4 |
| 3/11-3/15 | Spring Break | | | |
| 3/18 | 25 | Moment and Shear in a Beam | 346-360 | 7.5,.6,.7 |
| 3/20 | 26 | Moment and Shear in a Beam | " | 7.10,.12 |
| 3/22 | 27 | Test # 3 | | |

| | | | | |
|------------|----|---|-----------|-----------------|
| 3/25 | 28 | Stress in a Beam | Pg365-374 | EX 8.1,.2,.3,.4 |
| 3/27 | 29 | Section Modulus ex 8.5 8.6 | 375-379 | 8.1, 8.2, 8.3 |
| 3/29 | 30 | " | | 8.6, 8.10 |
| 4/1 | 31 | Shear Stress EX 8.8pg 388 | 382-389 | |
| 4/3 | 32 | Shear Stress Solid Rectangular Shape Ex8.11 | 390-395 | |
| 4/5 | 33 | Shear Stress I beam Shape | 396 -398 | 8.11 |
| 4/8 | 34 | Deflection in a Beam Ex 8.14 and 8.15 | 402-411 | |
| 4/10 | 35 | Test # 4 | | |
| 4/12- 4/26 | 41 | <i>Design and Build Project & Wood Stand Project</i> | | |

