

University of Texas at Tyler - Department of Civil Engineering
CENG 4316/5316: Advanced Steel Design

Instructor:	Dr. Michael Gangone RBS 1009 (903) 565-5872 mgangone@uttyler.edu	Office Hours: M/W: 2-3:30 PM THURS: 9:30AM – 10:30AM or by appointment
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Lectures:

Online through Canvas. There will be no live lectures. Videos and lesson material will be posted for you to review. Assignments will be posted and due on the dates specified in the assignment schedule.

Course Website:

Canvas will be used to manage the course material for the semester. There you will find homework assignments, solutions, handouts, lecture notes/videos and other material pertaining to the class. **Please check there regularly.**

Catalog Description:

Advanced design of structural steel systems emphasizing the relationship between design and response of the structural system; theoretical basis of building code provisions; limit state and plastic design; beam-column; built up sections and composite sections; and connections.

Learning Objectives:

1. Determine the design loads on a structure, determine load effects on structural components, and determine the load path through the structure
2. Use the LRFD and ASD design methodology
3. Analyze and design built up sections (columns and plate girders)
4. Analyze and design connections: direct shear, eccentric shear, direct tension, combined tension and shear
5. Analyze and design beam columns
6. Analyze and design moment connections and beam and column base plates
7. Analyze and design composite sections

Prerequisite:

CENG 4412 Steel and Concrete or CENG 4317 Structural Steel Design or consent of department chair.

Required Text:

Manual of Steel Construction 15th edition (or 14th edition if you have that instead), by American Institute of Steel Construction (AISC).

Recommended Text (particularly if you are interested in structural engineering):
 Salmon, Johnson and Malhas, Steel Structures: Design and Behavior, 5th edition, Prentice Hall.

Tentative Course Schedule:

COURSE SCHEDULE - SUBJECT TO REVISION					
CENG 5316.060/4316.060 Spring 2021 (ONLINE)					
Lesson No.	Suggested Date	Topic	Text: Salmon, Johnson, Malhas	Text: Segui	Video
WEEK 1					
1	1/12	Review: Loads	1.4, 1.8-1.9	1.2	Lesson 1
2	1/14	Review: Tension Members and Bolts	3.1-3.9, 3.11, 4.6-4.11	3.1-3.6, 7.1-7.9	Lesson 2 parts 1-3
WEEK 2					
3	1/19	Review: Compression Members	6.1-6.6, 6.8-6.11	4.1-4.7	Lesson 3 parts 1-5
4	1/21	Review: Flexural Members	7.1-7.8, 9.1-9.12	5.1-5.10	Lesson 4 parts 1-3
WEEK 3					
	1/25	Census Date			
5	1/26	Biaxial Bending	7.11, 8.4, 9.14	5.15	Lesson 5 parts 1-2
6	1/28	Beam Column Intro and Moment Amplification	12.3-12.5, 12.8	6.1-6.4	Lesson 6
WEEK 4					
7	2/2	Beam Column Intro and Moment Amplification			
8	2/4	Braced and Un-braced Frame Member Analysis	12.3-12.5, 12.11	6.5-6.7	Lesson 8
WEEK 5					
9a	2/9	Beam Column Design	12.10, 12.2-12.13	6.8	Lesson 9a
9b	2/9	Design of Frame Bracing	9.13	14.5	Lesson 9b
10	2/11	Composite Columns	16.15	9.10	Lesson 10
WEEK 6					
11	2/16	Beam Bearing Plates		5.14	Lesson 11
12	2/18	Exam 1			
WEEK 7					
13	2/23	Column Base Plates	13.9	5.14	Lesson 13
14	2/25	Eccentric Bolted Connections	4.12-4.15	8.1-8.3	Lesson 14
WEEK 8					
15	3/2	Welds for Concentrically Loaded Tension Members	5.11-5.16	7.10-7.11	Lesson 15
16	3/4	Eccentric Welded Connections	5.17-5.19	8.4-8.5	Lesson 16
SPRING BREAK (March 8 - March 12)					
WEEK 9					
17	3/16	Moment Connections	13.1-13.2, 13.6-13.7	8.6	Lesson 17
18	3/18	Column Reinforcement (Stiffeners)	13.6	8.7	Lesson 18
WEEK 10					
19	3/23	End Plate Connections	13.6-13.7	8.8	Lesson 19
20	3/25	Built-up Compression Members	6.8	4.9	Lesson 20
WEEK 11					
	3/29	Last Day to Withdraw			
21	3/30	Plate Girders: Flexural Analysis	11.1-11.11.6	10.1-10.4	Lesson 21
22	4/1	Exam 2			Lesson 22
WEEK 12					
23	4/6	Plate Girders: Shear Analysis and Bearing Stiffeners	11.7-11.8, 11.11-	10.5-10.6	Lesson 23
24	4/8	Plate Girders: Design	11.13-11.14	10.7	Lesson 24
WEEK 13					
25	4/13	Composite Section Analysis	16.2-16.5	9.1-9.3	Lesson 25
26	4/15	Composite Section Design: Solid Slab	16.7-16.8, 16.13	9.4-9.6	Lesson 26
WEEK 14					
27	4/20	Composite Section Design: Steel Formed Decking	16.9-16.12, 16.14	9.7-9.9	Lesson 27 parts 1-2
28	4/22	TBD			
WEEK 15					
Final Exam Week					

Exams:

There will be 2 midterm examination and one final examination. The midterm exams will be given during weeks 6 and 11 of the course. All exams are take home exams and you will be allowed to use any references to complete them. However, they are to be completed individually without assistance from any other person. The due date will be mentioned on the exam and within the assignment schedule.

Homework:

Homework will be assigned on a weekly basis. You may either submit the assignment by uploading the assignment as a **single pdf file** to Canvas. No late assignments will be accepted

without prior approval from the instructor. Because most every assignment will require the use of the AISC manual, **students should properly document their solution.** This means documenting the equation, table, figure, etc. and the page number from the AISC manual. Also document which version of the AISC manual you are using (14th or 15th edition). The **final answer should be boxed** and at the bottom of the problem.

Project:

For those taking this course as CENG 5316 you will be required to complete a project to receive credit for the course. The project will be due **April 22, 2021.**

Grades (CENG 4316):

Homework = 40%
Professional Practice = 10%
Midterm Exam 1 = 15%
Midterm Exam 2 = 15%
Final Exam = 20%

Grades (CENG 5316):

Homework = 30%
Professional Practice = 10%
Midterm Exam 1 = 15%
Midterm Exam 2 = 15%
Project = 10%
Final Exam = 20%

Grade Scale:

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

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

****NOTE:**

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

Professional Practice:

Your professional practice grade will be computed based upon the work you submit during the semester. This includes the professionalism of the submitted assignments and the number of assignments submitted.

Final day to withdraw:

The final day to withdraw from the course without penalty is **March 29th**

Census dates:

The university requires that instructors to report the attendance to the register at various points in the semester. Therefore, on **January 25th** I will be reporting to the University Registrar those that have attended class up to this date attendance.

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.

Important Covid-19 Information for Classrooms and Laboratories: Students are required to wear face masks covering their nose and mouth, and follow social distancing guidelines, at all times 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](#) 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, or a higher than normal temperature will be excused from class and should stay at home and may join the class remotely. Students who have difficulty adhering to the Covid-19 safety policies for health reasons are also encouraged to join the class remotely. 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.

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 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>

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.

Disability/Accessibility Services: In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Tyler at Texas offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including non-visible a diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.utt Tyler.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

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 unadministered 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 unadministered test, test key, homework solution, or computer program or information about an unadministered 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 SafeAssign™, available on Canvas. 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)

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.uttyler.edu/tobacco-free.

Campus Carry: We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>

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 Associate Professor
 Department of Civil and Environmental Engineering

ASSIGNMENT SCHEDULE - SUBJECT TO REVISION

CENG 5316.060/4316.060 Spring 2021 (ONLINE)

Homework No.	Topic	Date Assigned	Assignment Due (By 5 PM)
1	Tension Member Design	January 12, 2021	NOT COLLECTED
2	Compression Member and Flexural Member Design	January 19, 2021	NOT COLLECTED
3	Biaxial Bending and Beam Column Interaction	January 26, 2021	February 2, 2021
4	Braced and Un-Braced Frame Member Analysis	February 2, 2021	February 9, 2021
5	Beam Column Design	February 9, 2021	February 16, 2021
6	Beam Bearing Plate Design	February 16, 2021	NOT COLLECTED
7	Column Bearing Plate Design and Eccentric Bolted Connections	February 23, 2021	March 2, 2021
8	Eccentric Welded Connections	March 2, 2021	March 16, 2021
9	Moment Connections and Column Stiffeners	March 16, 2021	March 23, 2021
10	End Plate Connections and Built-up Columns	March 23, 2021	March 30, 2021
11	Plate Girder Analysis and Design	March 30, 2021	NOT COLLECTED
12	Composite Section Analysis and Design for Beams	April 13, 2021	NOT COLLECTED
	Project	January 12, 2021	April 22, 2021
	Exam 1	February 18, 2021	February 25, 2021
	Exam 2	April 1, 2021	April 8, 2021
	Final Exam	April 22, 2021	April 27, 2021