



## MEMORANDUM

To: CENG4350/5350 Students

From: Elina Efthymiou, Ph.D., Assistant Professor, Instructor CENG4350/5350

Date: January 10, 2025

Subject: CENG4350/5350 Course Administration, Spring 2025

**Instructor:**

Dr. Elina Efthymiou

RBS 1036

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✉ eefthymiou@uttyler.edu

**Office Hours:** TBD

M/W: 10:00AM – 12:30PM

or by appointment

**Lecture:** Monday/Wednesday: 4:05 – 5:30 PM, RBN 3039 (Tyler), 0A216 (HEC)

**1. Welcome to CENG4350/5350; Bridge Engineering.** This course in the structural design sequence relies on your understanding of important engineering concepts: static equilibrium (CENG2301), mechanics of materials (CENG3306), structural analysis (CENG3325) and reinforced concrete and steel design (CENG4412). In this course, we apply these fundamentals to understand how bridge structures work. We will build upon your current knowledge of loads and load combinations (CENG3325) and learn about loads that are applied to bridges. This course will introduce and prepare you to design new bridges and assess existing bridges following the current AASHTO design Code and other relevant code provisions. In the process, you will use computer-based design tools and modern technology (Revit, Robot Structural Analysis [RSA] or Visual Analysis [VA] and the Microsoft Office Suite). By the end of this course, you will be able to accomplish these objectives:

- a. **Distinguish** between the various types of bridges and **identify** their major components.
- b. **Understand** the fundamental requirements for bridge design and assessment.
- c. **Calculate** the self-weight of all the components of a bridge and **calculate** their resulting moments and shears in the bridge slab and girders.
- d. **Evaluate** the live load effects on the various bridge components according to the AASHTO LRFD code.
- e. **Use** applicable load case combinations to calculate the maximum internal forces and moments on the major bridge components.
- f. **Design** the bridge deck concrete slab.
- g. **Design** the bridge girders; prestressed concrete girders or steel stringers.
- h. **Identify** the fundamental concepts of bearing design and substructure design.
- i. **Apply** current AASHTO LRFD code provisions to ensure serviceability requirements of the bridge structural components.

j. **Utilize** advanced computer software packages to analyze and design a bridge.

**2. Course Materials.** The software for CENG4350/5350 are listed below. Course materials will be provided by the instructor as necessary.

- a. Visual Analysis (VA)
- b. Revit Structure 2024 ©2024 Autodesk, Inc.

Additional course material will be available on Canvas throughout the course.

**3. Course Prerequisites.** CENG 4412: Reinforced Concrete Design

**4. Class Outline**

- i. Bridge Types
- ii. Requirements for Bridge Design and Evaluation
- iii. Loads, Load Effects and Load Combinations
- iv. Superstructure Design
- v. Bearing Design
- vi. Substructure Design
- vii. Highway Bridge Assessment

**5. Grade plan:**

a. **Graded Events:** Your grade in **CENG4350** will be based on the following:

<b>Graded Event</b>	<b>Points</b>
Assignments / Quizzes	600 (30%)
Semester Project	200 (10%)
Professional Practice	200 (10%)
Midterm Exams (2@300 each)	600 (30%)
Final Exam	400 (20%)
<b>Total</b>	<b>2000 (100%)</b>

Your grade in **CENG5350** will be based on the following:

<b>Graded Event</b>	<b>Points</b>
Assignments / Quizzes	400 (20%)
Semester Project	200 (10%)
Professional Practice	100 (5%)
Midterm Exams (2@300 each)	600 (30%)
Final Exam	400 (20%)
Term Paper	300 (15%)
<b>Total</b>	<b>2000 (100%)</b>

b. **Grade Scale:** At the end of the term, your accumulated points will be converted to a letter grade. The following grade cutoffs are guaranteed:

<b>Grade</b>	<b>Cutoff %</b>
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. 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.

- c. All grades will be posted on Canvas. It is your responsibility to monitor your grades to determine if you are achieving the grade you desire.

#### **6. Midterm Exams:**

- a. This course includes two (2) mid-term Exams.
- b. Solutions to exams will **NOT** be posted on Canvas.
- c. 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 the circumstances described above, failure to take the exam at the scheduled time will constitute a grade of zero on the exam.
- d. The mid-term Exams are closed book.

#### **7. Final Exam:**

- a. All students will take the Final Exam.
- b. The final exam is closed book.

**8. Engineering Design Problem (EDP).** CENG4350/5350 includes one semester-long EDP with two interim submissions, three in-progress reviews, and one final design report. When all submissions are complete, you will have completed the preliminary design for a complete highway bridge. The late policy and submission time for the EDP is the same as the late policy for problem set submissions (see clause 13 of the present memo).

**9. Cell phones:** Please remember to turn off sound to your phone prior to class.

**10. Assignments:** Homework problems will typically be assigned on a weekly basis and will be design problems. You are encouraged to *discuss* your homework solutions with one another, but in the end you must submit your own, **independent** work. The homework due dates and times will be clearly given with the homework assignment on Canvas. Homework is due on the date outlined in the schedule. **You must upload your homework as a single pdf file, unless otherwise stated, to Canvas no later than 11:59pm on the date it is due.**

#### **11. Standards for written work:**

- a. **Neatness.** Sloppy, disorganized work will receive significant point reduction subject to your instructor's judgment.
- b. **Organization.** Homework should be logically organized. If doing calculations by hand, use engineering paper for problem sets and sample calculation pages. Use the format shown

in Enclosure 1 of this memorandum as the standard for homework and sample calculation pages. Many problems require a “*Given, Find, Formula, Solution*” format. Clearly present a **brief problem statement and a sketch** as the “*Given*” portion. Clearly and concisely explain each step. Many of my Example Solutions have numbered steps, include these numbered steps as part of the solution. For narratives of more than a line or two, type your answers in Word.

- c. **Explanation of Work.** When you do engineering calculations, you must explain your work such that an uninformed reader can follow precisely how and why you performed each step; tell a story as you work through a problem.
- d. **Drawings / Sketches.** As Engineers, we communicate with drawings. You must learn to supplement your engineering calculations with clear sketches. This will help others understand what you did and help you organize your thoughts and solve the problem. Importantly, you must learn to present completed design work in the form of comprehensive and detailed drawings. Use this course as an opportunity to refine your drawing skills. Use a straightedge for all straight lines. Use dimension lines. Print neatly.

## 12. Documentation of academic work:

- a. Use parenthetical documentation.
- b. All submissions must have a signed cover page. Before signing this document take time to reflect and ensure that all work is either yours or that credit is given within where due. Assignments will not be accepted without this signed cover page. For group assignments all members of the group must sign the cover sheet.

**13. Late policy: There is no late policy.** All assignments are due **on Canvas by 11:59pm on the date specified**, unless otherwise stated. **You will submit a single pdf file.** If you need to submit a late assignment, notify me ahead of time to coordinate when you will turn in the assignment.

**14. Professional Practice:** Your professional practice grade will be broken down into two components. (1) Half of the percentage points will be based on your attendance at **3 professional meetings** (cookout and game night events do not count) throughout the spring semester. Example of valid meetings include ASCE guest speakers, field trips, or any other technical meeting from either organization within the college of engineering. (2) the remaining percentage points are based on the professionalism in which you carry yourself in the class.

**15. 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.

**16. Policy on the use of AI:** AI is not permitted in this course at all. I expect all the work students submit for this course to be their own. I have carefully designed all assignments and class activities to support your learning. Doing your own work, without artificial intelligence assistance, is best for your efforts in mastering course learning objectives. For this course, I expressly forbid

using ChatGPT or any other artificial intelligence (AI) tools for any stages of the work process, including brainstorming. Deviations from these guidelines will be considered a violation of UT Tyler's Honor Code and academic honesty values.

**17. Final day to withdraw:** The final day to withdraw from the course without penalty is **March 31<sup>st</sup>**.

**18. Census date:** The university requires that instructors report the attendance to the registrar at various points in the semester. Therefore, on **January 27<sup>th</sup>** I will report the attendance for the class.

**19. Final guidance:** Be prepared to work hard and have fun this semester!

See Canvas for UNIVERSITY POLICIES AND ADDITIONAL INFORMATION THAT MUST APPEAR IN COURSE SYLLABUS

This syllabus is subject to revision by the instructor.

Elina Efthymiou, PhD

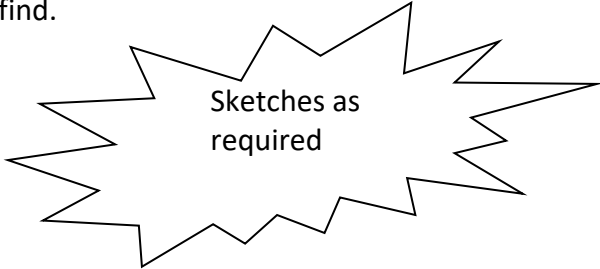


Assistant Professor  
CENG4350/5350 Course Instructor

**Enclosure 1: Standard for Problem Set Submissions and Design Problem Sample Calculations.**

Engineering Paper  
Required

Page #\_\_ of x pages total.  
(Place on all pages of the  
problem set)

	CENG4350/5350 Assignment #	Date Due: DD MMM YY (on first page only)	Name (on all pages)	1/x
<input type="radio"/>	<p><b>GIVEN:</b> Write a brief description of the information given in the problem statement.</p> <p><b>FIND:</b> Indicate the information you are to find for this problem. When you finish the problem, check this line to make sure you found all the things you were supposed to find.</p> <div data-bbox="553 747 1149 1014" style="text-align: center;">  <p>Sketches as required</p> </div> <p><b>SOL'N:</b> Indicates where the solution starts. Good solutions are neat and clearly written, reference equation numbers from the SCM or the text, and include notes of explanation. Drawings are neat and contain clear labels and dimensions.</p> <p>Put only one problem per page. Do not start a new problem in the middle of a page.</p> <p>Sloppy work or work which does not follow this format may result in a point cut.</p> <p>Use parenthetical documentation to indicate where you received assistance or information from others. For example:  <div style="margin-left: 40px;">(Helpful, I.M., '20 instructed me to check the deck slab in shear, not just bending and where to find the shear equation in the beam tables.)</div> </p> <p><u>“XXXXXXXXX ANS”</u> indicates your answer and the end of the problem. This should match the FIND line from above.</p>			
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