

MEMORANDUM FOR STUDENTS ENROLLED IN CENG 3351

SUBJECT: CENG 3351 Administrative Instructions, Spring 2026

1. Welcome to CENG 3351, the first course of your transportation engineering classes under the civil engineering curriculum. During the upcoming semester, I believe you will find our study of transportation engineering systems as well as pavement design and analysis to be interesting, challenging, and rewarding.
2. In this course you will learn the fundamentals of Transportation Engineering and be mainly introduced to the engineering analysis (and some design) process. You will be applying the principles from previous math, physics, and programming courses throughout this course and we will work to maximize the use of your computer in support of our work. In addition, our goal is to provide you with a solid foundation in understanding transportation engineering systems. This course has 6 specific objectives as shown in page 7. They can be generally grouped and summarized as learning about geometric design of highways, traffic engineering (i.e., traffic studies, capacity analysis, and signal control), transportation planning, and a variety of traffic software, and applying them to solve real-world transportation engineering analysis and design problems.
3. I teach 9:30 am - 10:50 am Tuesdays: face-to-face lecture at RBN 3040 and Thursday: Zoom synchronous and/or asynchronous sessions. If you miss a scheduled class, you are still responsible for the material. **My office hours are 11AM to 12 NOON every Tuesday. My office hours are administered face-to-face at (TBD) or via zoom.**
4. Class Room Procedures:
 - a. Canvas will be used to manage the course material for the semester. There you will find homework assignments, handouts and other material pertaining to the class. Please check there regularly. You will also submit all homework assignments via Canvas.
 - b. Bring study notes, textbook, note-taking material, and calculator to every class. You may not borrow or exchange calculators during graded events. If your calculator fails during a graded exercise, I am not responsible to furnish a substitute. Class preparation is your individual responsibility.
 - c. Textbook: [MKW] Mannering, F.L., and Washburn, S.S. (2013). *Principles of Highway Engineering and Traffic Analysis*, 5th Edition or newer, John Wiley & Sons, Inc. Available at the bookstore and web outlets.

Supplemental Textbooks/References: 1) Pavement Analysis and Design 2nd Edition by Huang 2) [GH] Garber, N.J. and Hoel, L.A. (2008). Traffic and Highway Engineering (4th Edition or newer). PWS Publishing. 3) [PP] Papacostas, C.S. and Prevedouros (2001). Transportation Engineering and Planning, 3rd ed. Prentice Hall, Inc., Englewood Cliffs, New Jersey. ISBN-10: 0130814199. ISBN-13: 978-0130814197. This textbook is the one used before. 4) [MY] May, A.D. (1990). Traffic Flow Fundamentals, Prentice Hall, Inc., Englewood Cliffs, New Jersey. 5) American Association of State Highway and Transportation Officials (2004). A Policy on Geometric Design of Highways and Streets, AASHTO, Washington, DC. 6) Additional handouts/references/articles will be provided in due course. Have fun!

- d. You are not required to use colored pencils or a straight edge, but colors and straight lines can help with emphasis and clarity in your notes.
- e. I will have unannounced quizzes although it may be actually announced. ☺
- f. **ACADEMIC DISHONESTY:** Representation of other's work as your own will not be tolerated. Cheating on examinations, quizzes, and homework, and the false representation of work will be interpreted as academic dishonesty. Academic dishonesty will be subject to disciplinary action as outlined by the UT Tyler Student Guide on Conduct and Discipline.

5. Exams and Grading:

- a. Grade Breakout and Cutoffs:

| <u>Course Points</u> | | <u>Grade Scale</u> |
|--|------------------|--------------------|
| Problem Sets and Quizzes (30~ 50 each) | 600 (30%) | A+ 96.67%..1933 |
| Mid-term Exams (2 at 250 each) | 500 (25%) | A 93.33%..1866 |
| Professional practice | 200 (10%) | A- 90.00%..1800 |
| Projects (2 at 100 each) | 200 (10%) | B+ 86.67%..1733 |
| Final Examination | <u>500 (25%)</u> | B 83.33%..1666 |
| | 2000 (100%) | B- 80.00%..1600 |
| | | C+ 76.67%..1533 |
| | | C 73.33%..1466 |
| | | C- 70.00%..1400 |
| | | D 65.00%..1300 |
| | | F <65.00%<1300 |

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**. Of course, final grades are only A, B, C, D, F. Therefore, a C- is a C for a final grade. This distribution is to graphically remind you of how well you are doing. **University grade breaks will be used in the final grade posting.**

- b. Mid-Term Exams and Final Exam:

- 1) The dates for Mid-Term Exams are included in the course schedule. Official reasons for missing an exam are outlined in "Student handbook". You are required to take a make-up Exam, regardless of your reason for missing the scheduled Exam. Report any conflict to me as soon as possible prior to the Exam.
- 2) Exams and the Final are closed book and notes.
- 3) 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 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.

-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.

- c. 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.
 - d. Embedded indicators of accomplishment of program outcomes: At times throughout the semester, portions of student work will be analyzed to determine if our program is accomplishing stated program outcomes based on established metrics. **If your work is below the minimum established metric, you will be required to repeat the assignment or that portion of the assignment until you achieve the minimum acceptable standard based on the metric.**
6. Homework: All homework is mandatory and becomes part of your grade, failure to submit any required homework will result in an incomplete. As an engineer your goal is to make a clear, logical, and professional presentation of your work, which is both accurate and correct. As such both your presentation and the accuracy of your work are important, and both will be graded. In order to insure correctness and model professional CE practice, this semester we will often encourage you to discuss with your classmates and submit all your work to your classmates for "Review". It is critical that you show all of your work and leave "foot prints" so that it can be easily followed. No guess work should be required to see what you did. **All submissions must be turned in by the beginning of the class on the due date and this rule will be strictly enforced throughout the semester. 5% Extra credit will be given for each fully computer-typed homework assignments.** Late submissions should be placed in my folder or the CENG 3351 box in RBS 1003. Additional guidance:
- a. Problem Sets (PS)

- 1) Include a title sheet.
- 2) **Use Engineer paper only or full-page printouts from Microsoft word, Mathcad, Excel, etc.** You may neatly tape or glue short computer printouts onto Engineer paper at the appropriate place in the logical flow of the problem. Only use one side of a page. Clearly present **a brief problem statement and a sketch** with your solution. Clearly and concisely explain each step. For narratives of more than a line or two, use your word processor or the text capability if you are using MathCAD or Excel. If you are writing out a paragraph or more, you must type it.
- 3) Late Submissions. It is a basic principle of professionalism that “**Professionals are not Late.**” A “COORDINATED LATE” submission occurs when you will miss the suspense for a graded homework assignment and you contact me in advance. Notification immediately before the submission will not suffice. Point cuts up to the amounts below **may** be assessed for a “COORDINATED LATE” submission:
 1. 0-24 hours late a deduction of 25% of the earned grade
 2. 24-48 hours late a deduction of 50% of the earned grade
 3. More than 48 hours late No credit. **Assignments must still be submitted.**

Obviously there are circumstances that will occur and make a timely submission impossible and I will work with you when and if they occur.

- 4) All homework in this course must be properly documented. As you are discussing and/or having your work reviewed it is likely that you might receive help from your classmates, just simply document it. Information from the course textbooks (equations and outlines of procedures), class notes, or me is considered immediately available to all students and need not be acknowledged or documented. **YOU ARE REQUIRED TO ACKNOWLEDGE AND DOCUMENT ALL OTHER ASSISTANCE AND REFERENCES USED.** Documentation will be accomplished in accordance with any manual for writing, footnote or endnote, for papers, but for written homework, just place the documentation right at the point you received help using who and what assistance.
- b. Assigned readings. Doing the assigned reading prior to class will help you to understand the material presented during the instruction and will fill in gaps for things we do not cover (***I will not cover everything***). It will also make you more familiar with terms and concepts to be covered. To help motivate you to do the reading there will be quizzes that you are required to complete prior to class on most readings. Be sure to check Blackboard, under assignments in a folder called Reading Quizzes. But I may or may not announce these quizzes in advance.
 - c. Projects. There will be one group projects in the middle of this course and one final project which will be individual. For group projects, you are encouraged to discuss, wrap up the work together, and learn from each other. For the individual final project, you can discuss the given problem with your classmates, but you must work and get everything done on your own as each projects are different. However, you are always encouraged to get any help from me.

7. There will be several opportunities to earn bonus points for outstanding work on problem sets and for completion of other optional assignments. Opportunities for bonus points will be clearly identified by me and announced in class. Make use of these opportunities to extend your learning!

8. **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/rightsresponsibilities.php>

9. **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

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 census date (**February 4th, 2026**).

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.

Topics Covered and Schedule (Tentative and Subject to Change)

| Date | Day | Materials Covered | | |
|---|-----------|--|----------------------------|----------|
| 1/13/2026 | T | Course Syllabus | | |
| 1/15/2026 | TR | Transportation Finance | Transportation Modes & ITS | CH 1 |
| 1/20/2026 | T | Equations of Motion & Human Factors | | CH 2 |
| 1/22/2026 | TR | Horizontal Alignment | | CH 3 |
| 1/27/2026 | M | Census Date | | |
| 1/29/2026 | T | Vertical Alignment | Stopping/Sight Distance | CH 3 |
| 2/3/2026 | TR | Horizontal/Vertical Problem Solving Session | | CH 3 |
| 2/5/2026 | T | Exam#1 Review | | |
| 2/10/2026 | TR | Exam #1 | | |
| 2/17/2026 | T | Traffic Flow - Vehicle Stream Variables/Models | | CH 5 |
| 2/19/2026 | TR | Stream Measurements | | CH 5 |
| 2/24/2026 | T | Highways: Uninterrupted Flow | LOS Basic Freeway | CH 6 |
| 2/26/2026 | TR | LOS Multilane | | CH 6 |
| 3/3/2026 | T | LOS Two-Lane | | CH 6 |
| 3/5/2026 | TR | Design Traffic Volumes | | CH 6 |
| Spring Break 3/10/2025-3/12/2025 | | | | |
| 3/3/2026 | T | Highways: Interrupted Flow | Signalized Intersection | CH 7 |
| 3/5/2026 | TR | Highways: Interrupted Flow | Signal Phasing and Timing | CH 7 |
| 3/17/2026 | T | Examples | | |
| 3/19/2026 | TR | Exam#2 Review | | |
| 3/24/2026 | T | Exam #2 | | |
| 3/26/2026 | TR | Flexible Pavement Design | | CH 4 |
| 3/31/2026 | T | Flexible Pavement Design | | CH 4 |
| 4/2/2026 | TR | Flexible Pavement Design | | Handouts |
| 4/7/2026 | T | Rigid Pavement Design | | CH 4 |
| 4/9/2026 | TR | Rigid Pavement Design | | CH 4 |
| 4/14/2026 | T | Intro to PaveXpress | | |
| 4/16/2026 | TR | Final Exam Review | | |
| 4/21/2026 | T | | | |
| Exam Week April 28th – April 30th Final Exam | | | | |

CENG 3351 Transportation Engineering Course Objectives:

1. Develop an organized approach to solving transportation system analysis and design problems.
2. Explain the transportation system facilities, flow, and control system from the supply and demand perspective, different transportation modes and their pros and cons, and current issues and technologies used in the transportation industry.
3. Explain the motions, braking distance, the human factors, horizontal/vertical alignment, superelevation design, stopping/passing sight distance, channelization, roundabouts, and traffic calming devices in road design.
4. Analyze vehicle stream models, relationship among flow/speed/concentration, and time-distance diagrams of flow, the capacity and level of service for both highways and freeways, signal detectors and controllers, signal timing, pretimed and actuated signal coordination.
5. Design flexible and/or rigid pavements based on existing or projected traffic conditions, soil conditions and expected service life.
6. Use commercially available software (such as PaveXpress) as a tool to perform traffic simulation and pavement design.

HOMEWORK FORMAT RULES

In doing your homework, you are required to follow the instructions listed below:

- Use a pencil - Do NOT use a pen.
- Completely erase any extraneous material - NO scratched out material should appear on the solutions
- Show all the pertinent details of how you obtained your solution
- Staple your assignment together - Do NOT use paper clips, dog-earring, or other means to assemble your hw.
- Write legibly, in print large enough to be easily read.
- Use 8 ½ by 11 inch engineering paper. Do NOT use paper torn from a spiral binder unless it is perforated and you can neatly remove the ragged edge.
- Use graph paper on problems requiring graphs
- Use straight edges to draw diagrams, schematics, etc.

Each homework problem must follow the structure given below:

Given: Concisely state the problem, including relevant sketches, units, etc.

Determine: State what is the goal of the problem (i.e. what is unknown)

Assumptions: List all assumptions used in solving the problem

Solution: Draw a Free-Body-Diagram and give a step-by-step solution of the problem, including explanatory sentences. **Be careful to keep track of units,** and

Double underline or put a box around your final answer.

Additional features of a GOOD homework

- Each problem should have a neatly drawn figure. If you are not a true artist, you should use a straight edge. Also, the figure should be large enough to be easily read and important variables associated with the problem should be labeled on the figure. A well drawn figure will greatly help you solve the problem and help me understand your solution
- Each solution should be well organized. Labels for parts a), b), c) etc. should be easy to locate and the solution should be placed in the proper section.
- Don't cram your solutions into a small space. There should be lots of "white space" in your solution. Leave blank lines between steps; this makes it much easier to grade and gives me room to make comments. Also, leave several blank lines between problems so that I can easily see where one problem ends and the next begins. **I would prefer that you start each problem on a new page.**
- A homework solution should be capable of being "read" just like a textbook example problem. This means that you include all the pertinent details of the solution as well as text to help the reader follow your analysis. (Include sentences in your solutions not just equations.) Explain what you are doing, tell where you have taken an equation from, etc.
- Any variable used should be described in words or clearly shown on a figure.
- For nearly every problem your approach should be:
 1. While you are writing the given & find think about the problem. Think about what you know and don't know; think about which fundamental law might relate the quantities; form a strategy!
 2. Start your solution with a very general equation (such as Newton's law, conservation of energy, conservation of momentum, etc) The equation should be written with symbols only.
 3. Simplify the equation and state why you have made your simplifications. Show all of the details. There should be words in your solution.
 4. Once the equation is simplified, then plug in the numbers. **EVERY NUMBER REPRESENTING A PHYSICAL QUANTITY MUST HAVE UNITS WITH IT!!!**
 5. Calculate the final answer and determine the final units. (Don't just slap the final units on)
 6. **Ask yourself if the answer makes sense** (e.g. you calculated a negative velocity but the object is moving to the right - correct solution: go back and look for your error; wrong solution: slap in a negative sign somewhere and hope the teacher doesn't notice.)
 7. Only at this point should you check your answer with the book's answer. If you are off, go back and rethink your analysis. If you can't find a good reason for your mistake, **DO NOT JUST FORCE THINGS TO GET THE CORRECT ANSWER; COME AND SEE ME SO THAT I CAN HELP YOU FIND YOUR MISTAKE!!!!** ☺

UNIVERSITY POLICIES AND INFORMATION

Please see your course canvas page.

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