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CE 4340: Transportation Engineering

CRN: 10754

Fall 2023

Version date: 8/5/2023

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In-person class meeting Tue, Thu 9:00 a.m. to 10:30 a.m. at LART 222 ☹️

Course Information: What this class is about and what we will do

COURSE DESCRIPTION

CE4340 is a required 3-credit core course for all undergraduate civil engineering majors. This course introduces transportation engineering as a sub-discipline in civil engineering. The topics covered in this course include all the transportation components in the Fundamentals of Engineering (FE) Examination, plus emerging technologies.

Students enrolled in CE4340 should have successfully completed CE1313 and CE2373 and earned grade C or better.

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

The objective of this course is to introduce to students the following transportation engineering topics. The primary goal is to prepare students with the fundamental knowledge of transportation engineering prior to their entries into the civil engineering industry.

The first part of the course is to, through the following topics, systematically introduce the field of transportation engineering to the students:

- The characteristics of transportation systems
- The importance of transportation in the economy and quality of life
- The legislations, funding, and administration of transportation systems in the U.S.
- The roles of civil engineers in transportation.

The remaining part of the course covers the following technical topics:

- Traffic stream models
- Traffic data collection
- Probabilistic traffic models
- Queuing models
- Level of service analysis
- At-grade intersections

- Grade separated interchanges
- Human and vehicle factors in highway geometric designs,
- Horizontal curves
- Vertical curves
- Traffic signs and markings
- Traffic signals
- Traffic safety and countermeasures
- Parking
- Urban transportation planning process
- Urban public transportation
- On-demand urban public transportation
- Intelligent transportation systems
- Connected and automated vehicles
- Freight transportation
- Air transportation
- Rail transportation
- Pedestrians and bicycle transportation
- Sustainability, resilience, equity
- Transportation and border security

At the end of this course, students will acquire knowledge and skills capable of analyzing the related problems and designing engineering solutions, including the topics that are tested in the Fundamentals of Engineering (FE) Examination. Detailed learning outcomes will be provided in the class notes of every topic.

LEARNING MODULES

The tentative weekly lesson and assessment plans are as follows:

CE4340 Fall 2023 Semester Schedule

Week #	1	2	3	4	5	6	7	8
Tue	29-Aug	5-Sep	12-Sep	19-Sep	26-Sep	3-Oct	10-Oct	17-Oct
Class meeting	No class	Chp 2 Intro to TE	Chp 4 Data collection	Chp 8, 9 LOS analysis	Chp 12 Signs & markings	Chp 14 Horizon curves	Chp 15 Vertical curves	Chp 17 Signals 1
HW, exam				HW01W due	HW02W due	Return graded HW01W, HW02W	HW03W due	HW04W due
Thu	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct
Class meeting	Syllabus	Chp 3 Traffic stream models	Chp 6, 7 Prob. & queuing models	Chp 10, 11 Intersection	Chp 13 Human & vehicle factors	Exam1 HW01W+HW02W	Exam 1 review + Chp 16 Safety	Chp 18 Signal 2
HW							Return graded Exam 1	
Sun	3-Sep	10-Sep	17-Sep	24-Sep	1-Oct	8-Oct	15-Oct	22-Oct
		HW01M due	HW02M due	HW03M due	HW04M due	HW05M due	HW06M due	HW08M due

Week #	9	10	11	12	13	14	15	16
Tue	24-Oct	31-Oct	7-Nov	14-Nov	21-Nov	28-Nov	5-Dec	12-Dec
Class meeting	Chp 19 Signal 3	Chp 20 Parking	Chp 25 CAV	Chp 23 Public Transport 2	Chp 26 Freight	Exam 3 review, Chp 31 Security	Chp 29 Ped, bike	Final Exam 10am
HW, exam	Return graded HW03W, HW04W	HW05W due	HW06W due	Return graded HW05W, HW06W		Return graded Exam 3		
Thu	26-Oct	2-Nov	9-Nov	16-Nov	23-Nov	30-Nov	7-Dec	
Class meeting	Exam2 HW03W+HW04W	Exam 2 review, Chp 24 ITS	Chp 22 Public transport 1	Exam 3 HW05W+HW06W	Thanks giving - no class	Chp 27 Air tpr	Chp 32 EV	
HW		Return graded Exam 2						
Sun	29-Oct	5-Nov	12-Nov	19-Nov	26-Nov	3-Dec	10-Dec	
	HW09M due	HW010M due	HW11M due	HW12M due	HW13M due	HW14M due	HW15M due	

The class meets twice a week for 80 minutes per meeting.
Class meeting may be in the forms of lecturer, problem solving or examination.
There will be weekly multiple-choice homework in Blackboard, all due on Sundays.
There will be 6 written homework (turn in written solutions in hard copy), all due in class on Tuesday.
There will be 3 written exams, each covers 2 written homework.

REQUIRED MATERIALS

Calculator

This class follows the NCEES's calculator policy of the FE Exam. Refer to: <https://ncees.org/exams/fe-exam>.

The following figure is the screenshot of NCEES website taken on 8/5/2023.

CALCULATOR POLICY

To protect the integrity of its exams, NCEES limits the types of calculators examinees may bring to exam sites. The list of approved calculators is reviewed annually.

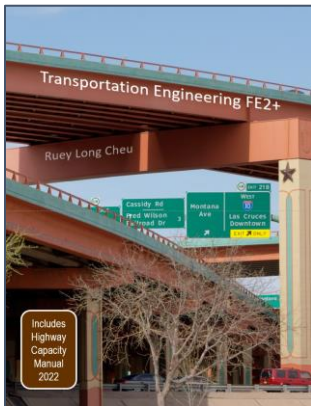
The following calculator models are the only ones acceptable for use during the 2023 exams:

- **Casio:** All fx-115 and fx-991 models (Any Casio calculator must have “fx-115” or “fx-991” in its model name.)
- **Hewlett Packard:** The HP 33s and HP 35s models, but no others
- **Texas Instruments:** All TI-30X and TI-36X models (Any Texas Instruments calculator must have “TI-30X” or “TI-36X” in its model name.)

Examples of approved calculators:



Textbook (Highly Recommended)



Transportation Engineering FE2+

By Ruey Long Cheu

ISBN 978-1-66785-878-4

This is the 2nd edition of the textbook written specially for this course. The 1st edition has been discontinued.

\$68 at <https://store.bookbaby.com> (before \$20 discount with coupon code) or Amazon.com.

The book is print-on-demand – may take 2-3 weeks to arrive.

Order early!

The slides only cover the essential parts of the course. You will need this textbook for self-study, review and understand the detailed contents.

COURSE ASSIGNMENTS AND GRADING

Letter grades will be assigned based on the final course marks (out of 100):

- A 90 and above
- B 80 to 89.99
- C 70 to 79.99
- D 60 to 69.99
- F below 60

Past 16+ years of data consistently shows that 15%-20% of the students earned A, About 25-35% of the students earned B and another 20%-30% earned C. There will be 10%-15% received D and a few deserved F.

Contributions towards final mark (out of 100%)

- 15% Attendance
- 30% Homework
 - 15% weekly online MCQ homework
 - 15% bi-weekly written homework
- 10% Exam 1
- 11% Exam 2

- 12% Exam 3
- 20% Final Examination#
- 2% Course evaluation, seminars, and other activities

Civil Engineering Department's policy: a student who does not score 50% or more of the total marks allocated to the Final Examination will automatically receive an F grade for the entire course. The purpose of this policy is to encourage students to retain the course materials.


TECHNOLOGY REQUIREMENTS

PowerPoint slides, homework, examinations, announcements, grades will be available in Blackboard. Office hours (consultations) and discussions will be in-person. Students may request by email for online consultation in Microsoft Teams. Mozilla Firefox is the recommended internet browser.

Course Communication: How we will stay in contact with each other

- **Office Hours:** Please see page 1.
- **Email:** UTEP e-mail is the best way to contact me outside the class meeting times and office hours. I will give priority to respond to your email **if you follow the following email guidelines**. When e-mailing me, be sure to email from your UTEP student account (@miners.utep.edu) and please put the course number in the subject line. In the body of your e-mail, start with a polite salutation, then clearly state your question. At the end of your e-mail, be sure to put your proper first and last names, and your UTEP identification number.
- Note: while starting your email with a greeting "Hello" or "Hi" is socially acceptable, it is not professional.

Example:

 Send	To	Cheu, Ruey L (Kelvin);
	Cc	
	Subject	CE4340 Exam 1
<p>Dr Cheu</p> <p>I am your student in the CE4340 Transportation Engineering course. I am not able to take Exam 1 during class time on September 1. The reason is I am selected as the captain of the UTEP soccer team. On September 1 we will be going to Guadalajara to play a pre-season match against Leones Negros. Please tell me how I can take Exam 1. Attached is the official letter from Coach Maradona. Thank you.</p> <p>Guillermo Ochoa 800011966</p>		

- **Discussions:** Discussion will be face-to-face during and immediately after class meetings, during the review sessions or during office hours.
- **Announcements:** Check the Blackboard announcements frequently for any updates, deadlines, or other important messages.

Course Policies: What do you need to do to be successful in the course

ATTENDANCE POLICY

Attendance will be taken in every class meeting, either by signing your signature in an attendance form, or calling your name to return graded homework. Your signatures will be checked for consistency throughout the semester. Inconsistent, missing signature, failure to pick up graded homework during class time, or failure to respond when your name is called will be marked as absent. For class meetings in Microsoft Teams, the sign-in and sign-out records will be used as the additional method of taking attendance.

HOMEWORK POLICY

- There are 2 types of homework:
 - Weekly homework: multiple-choice questions, to be answered in Blackboard. Weekly homework questions will be released on Monday morning of every week and are due on Sunday at 11:59 p.m. Marks and answers will be posted in the Gradebook in Blackboard in the following day.
 - Written homework: Six homework, each has 5 to 10 questions, from the lecture topics covered in the most recent weeks. Written homework questions will be released one week before the due date. The written solutions should be submitted during class meetings. Selected questions will be graded and returned to you. Solutions in the written homework must be presented according to the guidelines or face mark deductions (for every question and every homework, until you have done it correctly).
 - Use engineering paper.
 - Write on one side of the paper only.
 - Staple all the pages together on the left-top corner.
 - Write legibly.
 - Write your name and UTEP ID on the first page.
 - Begin every question on a new page. Write the question number on top of the page. It is not necessary to copy the question.
 - The solution to each question or each part of a question must include the following parts: (1) given values or assumed values; (2) the equation used; (3) calculations; (4) final answer and unit. Draw a box around the final answer. **Not having any of these components will have marks deducted for every question, for every homework.**
- Because I have given you plenty of time to complete the homework, no late submission will be accepted, unless you have an emergency or special situation.

EXAMINATION POLICY

- Examinations are conducted in-persons.
- **All examinations are mandatory.** A student who performs well in all aspects of the course until week 15 must still complete the final examination. Otherwise, 0 (zero) mark will be given for the final examination.
- Number and format of examinations:
 - Three mid-term exams:

Given during the class hour in the classroom. See the class schedule for the dates. Each exam will have 3 to 4 questions that need written solutions.

- Final exam.

Given on Dec 12, Tuesday in the final week, from 10:00 a.m. to 12:45 p.m.

2 hours 45 minutes. 50 multiple-choice questions covering the entire course to simulate the actual FE exams + 1 surprise question.

- You will be provided with equations, formula, tables, charts with the questions.
- To discourage students from focusing narrowly on only a few questions, **no practice exam will be given**. You may use the written homework problems in the textbook as practice questions.
- Rescheduling of an exam is possible if you inform me ASAP before the exam, with a valid reason. Examples of valid reasons are official UTEP travel, accident, medical, family emergency, jury duty, court appearance, military service, isolation/quarantine, job interview. These are not expected and cannot be rescheduled. You may need to show documentary evidence (e.g., doctor's letter, police report, court letter). Events that can be pre-scheduled or rescheduled are not valid reasons. Examples of non-valid reasons are vacation, wedding, driving test, sending car for service, etc. If an emergency happens during the exam day, you should contact me or the TA at the earliest possible time.
- Marks and solutions will be posted in Blackboard after each exam. The instructor/TA will conduct post-exam review sessions after the exams have been graded and returned to you.

CALCULATOR POLICY

- Civil Engineering Department's policy: only calculators permitted by NCEES for use in the current semester's FE exam are permitted to be used in the examinations.
- No other make and model of calculator will be allowed.
- Models previously allowed by NCEES in the past but are no longer valid for the current FE exam are prohibited in the CE4340 exams.
- This calculator policy may not be enforced by some professors but will be enforced in CE4340. Models allowed by other professors in his/her exam are not an excuse.
- If a student is found using an unapproved calculator is found during any exam, for the first time he/she will be given a warning. If this is repeated for the second time it will be reported as "cheating – bringing unauthorized materials into the exam" according to the UTEP Handbook of Operating Procedures. The most likely consequence is 0 (zero) mark for the exam, which will lead to the loss of one letter grade (e.g., C drops to D) for this course.

COURSE DROP POLICY

If you feel that you are unable to complete the course successfully, please let me know and then contact the [Registrar's Office](#) to initiate the drop process. If you do not, you are at risk of receiving an "F" for the course.

I may drop you from the course if you:

- Fail to attend more than 8 class meetings (in the attendance records); or
- Fail to submit more than 4 MCQ homework; or
- Fail to submit more than 2 written homework; or

Fail to submit more than 1 exam.

I will not drop you from the course if you are being investigated for cheating.

EXTRA CREDIT POLICY

I will not give extra credit to individual – this is considered a form of preferential treatment/discrimination, which is unfair to other students in the course. If an opportunity to earn extra credit arise, all students in the course will have equal opportunity.

ACCOMMODATIONS POLICY

The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the [UTEP Center for Accommodations and Support Services](#) (CASS). Contact the Center for Accommodations and Support Services at 915-747-5148, or email them at cass@utep.edu, or apply for accommodations online via the [CASS portal](#).

SCHOLASTIC INTEGRITY

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the [Office of Student Conduct and Conflict Resolution \(OSCCR\)](#) for possible disciplinary action. To learn more, please visit [HOOP: Student Conduct and Discipline](#).

CLASS RECORDINGS

Recording of class proceedings, either voice or video, by student is not allowed. Doing so may result in disciplinary action.

PLAGIARISM DETECTING SOFTWARE

Some of your course work and assessments may submitted to SafeAssign, a plagiarism detecting software. SafeAssign is used review assignment submissions for originality and will help you learn how to properly attribute sources rather than paraphrase.

COPYRIGHT STATEMENT FOR COURSE MATERIALS

All materials (textbook, homework questions and solutions, exam questions and solutions) used in this course are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. They may not be further disseminated, such as posting in the Internet or social media. Doing so may result in disciplinary action.

COVID-19 PRECAUTIONS

Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations. If you have tested positive for COVID-19, you are encouraged to report your results to covidaction@utep.edu, so that the Dean of Students Office can provide you with support and help with communication with your professors. The Student Health Center is equipped to provide COVID 19 testing.

The Center for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way that Miners can take care of Miners is to get the vaccine. If you still need the vaccine, it is widely available in the El Paso area, and will be available at no charge on campus during the first week of classes. For more information about the current rates, testing, and vaccinations, please visit epstrong.org.

Course Resources: Where you can go for assistance

UTEP provides a variety of student services and support:

Technology Resources

- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.

Academic Resources

- [UTEP Library](#): Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- [University Writing Center \(UWC\)](#): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- [Math Tutoring Center \(MaRCS\)](#): Ask a tutor for help and explore other available math resources.
- [History Tutoring Center \(HTC\)](#): Receive assistance with writing history papers, get help from a tutor and explore other history resources.
- [RefWorks](#): A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.

Individual Resources

- [Military Student Success Center](#): Assists personnel in any branch of service to reach their educational goals.
- [Center for Accommodations and Support Services](#): Assists students with ADA-related accommodations for coursework, housing, and internships.

- [Counseling and Psychological Services](#): Provides a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments.

