

## **CE 4340: Transportation Engineering**

CRN: 25156

Spring 2023

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Office Hours: Thursday 10:30 a.m. – 12:00 p.m. @ A205 College of Engineering

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

#### **COURSE DESCRIPTION**

CE4340 is a required 3-credit core course for all civil engineering undergraduate 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 in the transportation.

Students enrolled in CE4340 should have successfully completed CE1313 and CE2373 and earn 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 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 legislation, 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 measurements
- Probabilistic models, deterministic queuing models
- Level of service analysis
- At-grade intersections and grade separated interchanges
- Highway geometric designs, horizontal, vertical curves

- Traffic signs and markings
- Traffic signals
- Traffic safety and countermeasures
- Parking
- Urban transportation planning process
- Urban public transportation
- Personalized urban public transportation
- Intelligent transportation systems
- Connected and automated vehicles
- Freight transportation
- Air transportation
- Rail transportation
- Non-motorized transportation
- Sustainability, resilience, and related topics
- 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 learning and assessment activities are arranged by weeks:

- Every week: 2 lectures, 1 online MCQ homework.
- Every 2 weeks: 1 hand-written homework.
- Every 3 to 4 weeks: mid-term or final examination.

The tentative weekly lesson and assessment plans are as follows:

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Tuesday	17-Jan	24-Jan	31-Jan	7-Feb	14-Feb	21-Feb	28-Feb	7-Mar	14-Mar	21-Mar	28-Mar	4-Apr	11-Apr	18-Apr	25-Apr	2-May	9-May
	Syllabus	Chp 4	Chp 6	Chp 8	Chp 10	Exam 1 HW 01-02	Chp 13	Chp 15 & 16	No class	Exam 2 HW03-04	Chp 19	Chp 22 & 23	Chp 25	Exam 3 HW05-06	Chp 29	Meme present	Final Exam
			HW01W Due		HW02W Due		HW03W Due			HW04W Due			HW06W Due				
Thursday	19-Jan	26-Jan	2-Feb	9-Feb	16-Feb	23-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr	4-May	
	Chp 2 & 3	Chp 5	Chp 7	Chp 9	Chp 11	Chp 12	Chp 14	Chp 17	No class	Chp 18	Chp 20 & 21	Chp 24	Chp 26	Chp 27 & 28	Chp 30 & 31	Review	
											HW05W Due						
Sunday	22-Jan	29-Jan	5-Feb	12-Feb	19-Feb	26-Feb	5-Mar	12-Mar	19-Mar	26-Mar	2-Apr	9-Apr	16-Apr	23-Apr	30-Apr	7-May	
	HW01M Due	HW02M Due	HW03M Due	HW04M Due	HW05M Due	HW06M Due	HW07M Due	HW08M Due		HW09M Due	HW10M Due	HW11M Due	HW12M Due	HW13M Due	HW14M Due	HW15M Due	

## REQUIRE MATERIALS

Calculator

A calculator approved for use in FE Exam (refer to <https://nces.org/exams/calculator/>)


The following calculator models are the only ones acceptable for use during the 2021 exams:

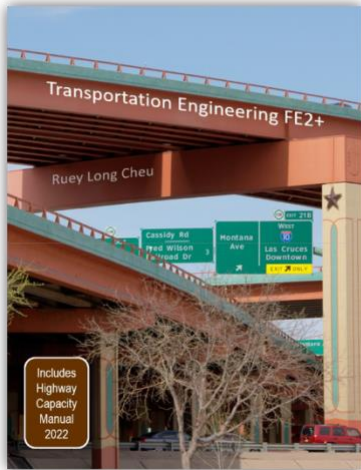
- **Casio:** All fx-115 and fx-991 models (Any Casio calculator must have "fx-115" or "fx-991" in its model name.)
- **Hewlett Packard:** The HP 33s and HP 35s models, but no others
- **Texas Instruments:** All TI-30X and TI-36X models (Any Texas Instruments calculator must have "TI-30X" or "TI-36X"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

Examples of approved calculators:



Textbook (Required)

 <p><b>FE Reference Handbook</b></p>	<p>FE Reference Handbook, Version 10.0.1 Free download from <a href="http://www.ncees.org">www.ncees.org</a></p>
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### **Transportation FE2+**

by Ruey Long Cheu  
ISBN 978-1-09839-155-3

This is the textbook written specially for this course

Purchase at

<https://store.bookbaby.com/book/transportation-engineering-fe2>

or

[Amazon](#)

Only hardcopy is available. No PDF file from this book will be posted in Blackboard.

MSRP \$68. Students in this course will be given discount during check-out at BookBaby. The discount code (**\$2325156cE430**) is valid only until Jan 21.

Written-homework problems will be taken out of this book. 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

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

Extra credit:

3% Creation of a transportation meme

# 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.

## TECHONOLOGY 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. Ensure your UTEP email account is working and that you have access to the Web and a stable web browser. Mozilla Firefox is recommended.

You will need to have access to a computer/laptop, scanner, a webcam, and a microphone. You will need to download or update the following software: Microsoft Office, Adobe Acrobat Reader, Windows Media player, QuickTime. Check that your computer hardware and software are up-to-date and able to access all parts of the course.

If you do not have a word-processing software, you can download Word and other Microsoft Office programs (including Excel, PowerPoint, Outlook and more) for free via UTEP's Microsoft Office Portal. Click the following link for more information about [Microsoft Office 365](#) and follow the instructions.

IMPORTANT: If you encounter technical difficulties beyond your scope of troubleshooting, please contact the UTEP [Help Desk](#) as they are trained specifically in assisting with technological needs of students. Please do not contact me for this type of assistance. The Help Desk is much better equipped than I am to assist you!

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

- **Office Hours:** Thursday 10:30 a.m. – 12:00 p.m. @ A205 College of Engineering
- **Email:** UTEP email is the best way to contact me outside the class meeting times and office hours. I will make every attempt to respond to your email within 24 hours of receipt if you follow the following email guidelines. When emailing 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 email, start with a polite salutation, then clearly state your question. At the end of your email, be sure to put your first and last name, and your university identification number.

Example:

Good morning Dr. Ke / Prof. Ke / Ruimin,

I am your student in the CE4340 Transportation Engineering course. I am not able to take Exam 1 during class time on [Date]. The reason is I am selected as the captain of the UTEP soccer team. On [Date] we will be going to Guadalajara to play a match against Leones Negros. Please advise how I can take Exam 1. Attached is the official letter from Coach Maradona.

Thank you,  
[First name] [Last Name]  
[Student number]

- **Discussions:** Discussions 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 Blackboard.
- **Biweekly written homework:** 5 to 10 questions, from the lecture topics covered in the most recent 2 weeks. Biweekly written homework questions will be released 2 weeks 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.
- Because there is 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.
- Number and format of examinations:
  - Three mid-term exams:

- Given during the class hours in the classroom. See the class schedule for the dates. Format TBD.
- Final exam:
  - Given on May 9, Tuesday in the final week, from 10:00 AM to 12:45 PM
  - 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. The instructor/TA will conduct a review session on May 4 before the exam.
- 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 nonvalid 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. Please check <https://ncees.org/exams/calculator/> for the latest permitted calculator models.
- This calculator policy may not be enforced by some professors but will be enforced in CE4340. Models allowed by another professors in his/her exam are not an excuse. This is CE4340 and you should follow CE4340 course policy.
- If a student is found using an unapproved calculator 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.

#### **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 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**

3% extra credit if you create and present a transportation meme. I will not give other extra credit to individual – this is considered a form of preferential treatment/discrimination. If 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](mailto: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 be submitted to SafeAssign, a plagiarism detecting software. SafeAssign is used to 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 on 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](mailto: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 themselves is to get the vaccine. If you still need the vaccine, it is widely available in the El Paso area. For more information about the current rates, testing, and vaccinations, please visit <https://www.epstrong.org/> and [COVID-19 Testing at UTEP](#).

### **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.

