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CE 4340: Transportation Engineering

CRN: 11385

Fall 2022

Professor Kelvin Cheu

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(915) 747-5717

Office Hours: TBD @ A208 College of Engineering

In-person class meeting Tue, Thu 9:00 a.m. to 10:30 a.m. at COBA 304

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 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 2022 Semester Schedule

Week #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Tue	23-Aug	30-Aug	6-Sep	13-Sep	20-Sep	27-Sep	4-Oct	11-Oct	18-Oct	25-Oct	1-Nov	8-Nov	15-Nov	22-Nov	29-Nov	
Class meeting	Syllabus, course overview	Chp 4 Traffic stream	Chp 6, 7 Prob. & queuing	Chp 10 Intersect. ions	Chp 12 Signs & markings	Exam1 HW01W+ HW02W	Chp 14 Horizon curves	Exam 1 review	Chp 17 Signals 1	HW03W + HW04W review	Chp 19 Signals 3	Chp 20 Parking	HW05W + HW06W review	Chp 23 Public Transport	Exam 3 review	Final Exam 10am
			HW01W due	HW02W due				HW03W due	HW04W due		HW05W due	HW06W due				
Thu	25-Aug	1-Sep	8-Sep	15-Sep	22-Sep	29-Sep	6-Oct	13-Oct	20-Oct	27-Oct	3-Nov	10-Nov	17-Nov	24-Nov	1-Dec	
Class meeting	Chp 2 Intro to tpt. eng	Chp 4 Data collection	Chp 8, 9 LOS analysis	Chp 11, 12 Inter-change, signs	HW01W + HW02W review	Chp 13 Human & vehicle (video)	Chp 15 Vertical curves	Chp 16 Safety	Chp 18 Signal 2	Exam2 HW03W+ HW04W	Exam 2 review	Chp 22 Public transport 1	Exam3 HW05W+ HW06W	Thanks giving - no class	Chp 24, 24, 25	
Sun	28-Aug	4-Sep	11-Sep	18-Sep	25-Sep	2-Oct	9-Oct	16-Oct	23-Oct	30-Oct	6-Nov	13-Nov	20-Nov	27-Nov	4-Dec	
	HW01W due	HW02W due		HW03W due		HW04W due		HW05W due				HW06W due			HW07W 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 7 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 homeworks.

The final exam will have 50 multiple choice questions + 1 surprised question from the entire course.

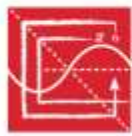
REQUIRED MATERIALS

Calculator

This class follows the NCEES's calculator policy of the FE Exam.

Refer to <https://ncees.org/exams/calculator/>.

The following figure is the screenshot of NCEES website taken on 8/4/2022.



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 2022 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)



FE Reference Handbook, Version 10.0.1.
Free download from www.ncees.org.



Transportation Engineering FE+

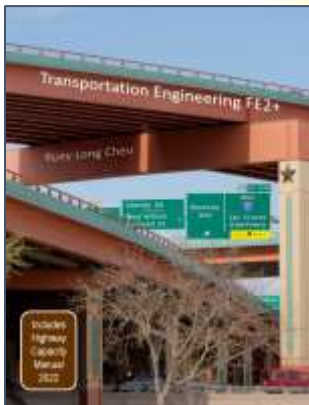
By Ruy Long Cheu
ISBN 978-1-09839-155-3

This is the textbook written specially for this course.

Purchase at <https://store.bookbaby.com>.

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

\$44 before discount. (Special discount for CE4340 students: 50% discount code will be announced in class).



Transportation Engineering FE2+

By Ruy Long Cheu
ISBN 978-1-66785-878-4

This is the 2nd edition of the textbook written specially for this course.

Purchase at <https://store.bookbaby.com> or Amazon.com.

\$68.

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 15+ years of data consistently shows that 15%-20% of the students earned A, About 25-35% of the students earned B and C respectively. 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 first and last name, and your UTEP identification number.
- Note: while starting your email with a greeting "Hello" or "Hi" is socially acceptable, it is not professional.

Example:

	To	Cheu, Ruyi L (Kelvin)
	Cc	
Subject		CE4340 Exam 1

Dr Cheu

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.

Guillermo Ochoa
800011966

- **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 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 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.
- 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 6, 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. 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 other 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 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.

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 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 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 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.

