

Course Number	CE 454 Fall Quarter 2013
Title	Urban Transportation Systems
Section	001
CRN(s)	10561
Credits	4
Prerequisite(s)	CE 351
Days/Time	TR 8:00 - 9:50
Location	EB102
Final Exam Day/Time	Thursday, December 12, 08:00-09:50, Room EB102
Course Website	D2L
Instructor	Dr. Christopher M. Monsere, P.E.
Office	301B Engineering Building
Phone & Voicemail	503-725-9746
E-mail	monsere@pdx.edu
Office Hours	Wednesday 11-12:00 PM, others by appointment
Mailbox Location	CEE Office, Engineering Building Room 200
Required Text:	
Mannering, Fred L. and Kilareski, Walter P. <i>Principles of Highway Engineering and Traffic Analysis</i> , 5th ed., 2011	

Recommended References/Optional Text/Supplemental Readings & Resources:

1. *Highway Capacity Manual, Fifth Edition*, 2010, Transportation Research Board, 2010. See <http://hcm.trb.org/>.
2. *Transit Capacity and Quality of Service Manual*, Third Edition, Transit Cooperative Research Program Web Document 6, Transportation Research Board, 2013. <http://www.trb.org/Publications/Blurbs/169437.aspx>
3. *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD 2003), Federal Highway Administration, 2003. Available free at: <http://mutcd.fhwa.dot.gov/>

Catalog Course Description

Urban street patterns and transportation demand, highway capacity analysis, process of urban transport planning, travel-demand forecasting and its application to traffic studies. Development of transport models, multiple regression analysis, models of land use and trip generations, stochastic trip distribution models, applications and case studies. Route assignment analysis and traffic flow theory.

Course Statement

The planning, design and operation of the transportation system can significantly impact the public's quality of life, economic vitality, and health -- both positively and negatively. Transportation systems are complex and all civil engineers should have a fundamental understanding of many of the key components (highways, traffic signals, public transportation) interact and how transportation can shape land use. The class is organized into two key modules, understanding highway capacity, service quality and performance measurement and urban transportation planning. Other topics are included as time permits. Together with CE351, students should have an understanding of the basic transportation system.

Course Schedule - SUBJECT TO CHANGE

#	D	Date	Topic	Readings	Problem Set
1	T	1-Oct	Introduction	Lecture Notes	1Intro Letter
2	R	27-Sep	Human Factors and Traffic Control	Lecture Notes	
3	T	8-Oct	Measuring System Performance	Lecture Notes	2Detector Analysis
4	R	10-Oct	Highway Capacity - Freeways	6.1-6.4	
5	T	15-Oct	Highway Capacity - Multi and Two-Lane Highways	6.5-6.7	3HCM Problems
6	R	17-Oct	Introduction to Simulation and Statistics Review	Lecture Notes	
7	T	22-Oct	Lab - VISSIM	Lab	4VISSIM Lab Report
8	R	24-Oct	Lab - VISSIM	Lab	
9	T	29-Oct	Guest Lecture and Exam Review		
10	R	31-Oct	Exam 1		
11	T	5-Nov	Traffic Analysis at Signalized Intersections	7.1-7.3	5Signal Analysis
12	R	7-Nov	Signal Phasing and Timing Plans	7.4-7.5	
13	T	12-Nov	Level of Service at Signalized Intersections	7.6-7.8	6LOS Signals
14	R	14-Nov	Introduction to Planning	8.1-8.3	
15	T	19-Nov	Trip Generation and Distribution	8.4-8.5	7Trip Generation
16	R	21-Nov	Mode and Route Choice	8.5-8.9	
17	T	26-Nov	Lab - SAND	Lab	8Mode and Route
18	R	28-Nov	No Class Thanksgiving		
19	T	3-Dec	Safety Analysis	Lecture Notes	9SAND LAB REPORT
20	R	5-Dec	Project Poster Presentations		
21	R	12-Dec	Final Exam 8:00-9:50AM EB102		
					Final Report DUE

Course Objectives – Students must demonstrate the ability to:

1. Be able to describe the current challenges and opportunities facing transportation.
2. Calculate level-of-service for various highway types.
3. Develop and analyze a simple simulation model of freeway ramp interchange.
4. Understand the interaction between land use and transportation and how it is modeled.
5. Be familiar with the four classical steps in travel demand forecasting and understand their strengths and weaknesses.
6. Perform individual work and communicate to colleagues and instructor.

Course Evaluation

The course grade will be determined with the following weight for class assignments:

Assignment	Percent of Total Grade
Homework and Lab Reports	15%
Participation	5%
Exam 1	30%
Group Project	20%
Final Exam	30%

I will drop your lowest homework grade when computing the final grade.

Grades will be logged and posted in D2L for your review. If we have made a mistake in recording your grade, please send me an email with subject heading “grade correction” notifying me of my error. I will ask you to show me the corrected assignment. For this reason, save all your returned work!

Expectations of the Student

Professionalism

All assignments and class participation should be conducted in a professional manner. Attention to detail on class assignments and communication is important and is part of the learning experience and it will be included in part of student evaluation.

Ethics

As future professional engineers you should plan to take the Fundamentals of Engineering Exam

and after the required experience, the Professional Engineering Exam (see the Oregon State Board of Examiners for Engineering and Land Surveying at www.osbeels.org). You should also be familiar with the ASCE Code of Ethics (www.asce.org/inside/codeofethics.cfm), which includes the following:

Engineers shall act in such a manner as to uphold and enhance the honor, integrity and dignity of the engineering profession.

The PSU Student Conduct Code prohibits all forms of academic cheating, fraud, and dishonesty. Further details can be found in the PSU Bulletin. Allegations of academic dishonesty may be addressed by the instructor, and/or may be referred to the Office of Student Affairs for action. Acts of academic dishonesty may result a failing grade on the exam or assignment for which the dishonesty occurred, disciplinary probation, suspension or dismissal from the University. The students and the instructor will work together to establish optimal conditions for honorable academic work. Questions about academic honesty may be directed to the Office of Student Affairs (www.ess.pdx.edu/osa/).

Calculator

For exams,

D2L

Check the class site regularly for updates, posting, and lecture notes. Homework assignments and due dates will be clearly communicated here..

Late Work

Late work is not accepted. The due date for each assignment is clearly indicated and the work must be turned in at the start of class when requested by the instructor unless indicated otherwise. Exceptions can only be granted in the most extenuating circumstances. Please don't ask for exceptions unless you think they agree with the above statement.

Incomplete

A grade of incomplete “I” is granted by the instructor *only* with prior approval and consent. Criteria are outlined in the PSU Bulletin.

E-mail

Email is the best way to reach me. I ask that you include CE454 and topic of your message in the subject line (be as specific as possible) when sending me an email. Try to use other means to answer your question before emailing me. Give me enough detail to answer your question or I might not have the time to reply.

Please note that the CEE Department requires communication by the PSU email (@pdx.edu or @cecs.pdx.edu). If you send me email from other than a PSU account, you run the risk of it being captured by the SPAM filter or it being deleted.

Description of Assignments

Homework and Lab Reports (15% of final grade)

One assignment per week, except for exam week will be assigned during the class session and are due the following week at the start of class. Your name, problem set number, and date should appear on the header of each page. Not all problems will be graded by the teaching assistant. Lab reports and other writing will have a grade assigned for writing.

Participation (5% of the final grade)

We will do activities in class that will help in your learning of the material that can not be duplicated outside of the classroom. Participation will be assessed by TopHat by logging responses to questions administered during class and discussion boards.

Exams (60% of final grade)

Two closed book exams in this class – including the final exam which will be a comprehensive in-class exam.

Group Project (20% of final grade)

For the final project, a group of four to five members is ideal and will either be assigned or self-selected. Each team member is expected to contribute and you will have the opportunity on the final exam to provide input on the amount of work done by each team member. All submissions are electronic in PDF format. The following sub-assignments are part of the final project:

Project Proposal (25% of group project grade)

A template for the proposal with instructions is provided on the class d2L site.

Final Poster Presentation (15% of group project grade)

We will have a poster session for presentation of final project results.

Final Report (60% of group project grade)

See template on class D2L site.

Resources

Student Groups and Professional Organizations

Participation in student and professional groups can be a valuable part of your education experience. Membership gives students opportunities to get to know fellow students better, meet and network with professionals, collaborate in solving real engineering problems, learn about internship or job possibilities, socialize and have fun. Your fellow students can be a great source of help and guidance in your academic endeavors. Consider becoming active with a student organization, such as the following:

- American Society of Civil Engineers Student Group (ASCE): www.asce.pdx.edu
- Students in Transportation Engineering And Planning (STEP): <http://www.step.groups.pdx.edu/>
- Engineers Without Borders <http://www.enwb.pdx.edu/>
- Student Water Resources Group <http://www.swrg.groups.pdx.edu/>
- Chi Epsilon Civil Engineering Honor Society <http://web.cecs.pdx.edu/~cee/honor/>
- Tau Beta Pi - The Engineering Honor Society /

Most professional organizations have monthly meetings and encourage student participation by providing discounts for lunch and dinner meetings. These meetings provide opportunities to network with potential future employers, learn about scholarships, and increasing your technical knowledge. Take a look at these organizations as a starting point:

- American Society of Civil Engineers (ASCE) Oregon Section: www.asceor.org
- Institute of Transportation Engineers (ITE) Oregon Section: www.oregonite.org
- Society of Women Engineers (SWE) Columbia River Section - www.swe-columbia-river.org

- Structural Engineers Association of Oregon (SEAO): www.seao.org
- Women's Transportation Seminar, Portland Section: wtsinternational.org

Research and Learning Opportunities

Transportation is a growing and exciting research area at Portland State University. I invite you to review the research in the Intelligent Transportation Systems Laboratory (www.its.pdx.edu/). Also, every Friday during the semester a Transportation Seminar is presented. All are welcome. The schedule is available at www.cts.pdx.edu

Campus Help

As a PSU student, you have numerous resources at your disposal. Please take advantage of them while you are here. A small sample is listed below:

- CEE Website (includes program info, job listings, etc.): <http://www.cee.pdx.edu/>
- Career Center: www.career.pdx.edu/
- Center for Student Health & Counseling: www.shac.pdx.edu/

- The Writing Center: www.writingcenter.pdx.edu/
- PSU Disability Resource Center is available to help students with academic accommodations. If you are a student who has need for test-taking, note-taking or other assistance, please visit the DRC and notify the instructor at the beginning of the term.

Library and Literature Research

Not everything can be found with Google. You will often need to use real library search tools and access real books and articles contained in refereed/archival journals. Be sure to make use of the Vikat library catalog. Go to the PSU library home page at www.lib.pdx.edu/.

Campus Safety

The University considers student safety paramount. The Campus Public Safety Office is open 24 hours a day to assist with personal safety, crime prevention and security escort services. Call 503-725-4407 for more information. For Campus emergencies call 503-725-4404.

Final Notes

- The syllabus is subject to change at the discretion of the instructor as course or other circumstances requires.
- Students with documented disabilities are encouraged to discuss with me arrangements that will enhance their learning in this class.
- Please feel free to discuss with me problems/concerns with your other classes.

Professor Robert L. Bertini contributed his syllabus from previous CE454 courses, of which much of this material is based and greatly appreciated.