

Course Number	CE 454 Fall Quarter 2009
Title	Urban Transportation Systems
Section	001
CRN(s)	10467
Credits	4
Prerequisite(s)	CE 351
Days/Time	MW 8:00 - 9:50
Location	Cinema 90
Final Exam Day/Time	Monday, December 7, 08:00-09:50, Room CIN 90
Course Website	http://www.ce.pdx.edu/~monserec/
Instructor	Dr. Christopher M. Monsere, P.E.
Office	301B Engineering Building
Phone & Voicemail	503-725-9746
E-mail	monsere@pdx.edu
Office Hours	Tuesday 11-12 AM, others by appointment
Mailbox Location	CEE Office, Engineering Building Room 200
Required Text:	
	Mannerling, Fred L. and Kilareski, Walter P. <i>Principles of Highway Engineering and Traffic Analysis</i> , 4th ed., 2009.

Recommended References/Optional Text/Supplemental Readings & Resources:

1. Khisty, C. Jotin and Lall, B. Kent, *Introduction to Transportation Engineering*, 2002.
2. *Highway Capacity Manual 2000*, Transportation Research Board, 2000. See Highway <http://www.ahb40.org> for more information.
3. *Transit Capacity and Quality of Service Manual*, Transit Cooperative Research Program Web Document 6, Transportation Research Board, 1999. http://trb.org/news/blurb_detail.asp?id=2326
4. *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD 2003), Federal Highway Administration, 2003. Available free at: <http://mutcd.fhwa.dot.gov/>
5. *A Policy on Geometric Design of Highways and Streets*, American Association of State Highway and Transportation Officials (AASHTO Green Book), 2001.
6. *Highway Design Manual*, Oregon Department of Transportation, 2003
<http://www.odot.state.or.us/tsroadway/2003-english-hdm.htm>
7. *Mechanistic-Empirical Pavement Design Guide* National Cooperative Highway Research Program (NCHRP)
<http://www.trb.org/mepdg/guide.htm>

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	Due Dates	
1	M	29-Sep	Introduction	1.1-1.7	1 Intro Letter and Learning Inventory	6-Oct	
2	W	30-Sep	Review: Traffic Flow and Queuing Theory	5.1-5.4			
3	M	6-Oct	Measuring System Performance, Projects Group Selection	Handouts	2	13-Oct	
4	W	8-Oct	Highway Capacity	6.1-6.4			
5	M	13-Oct	Highway Capacity (cont)	6.5-6.7	3	20-Oct	
6	W	15-Oct	Introduction to Simulation and Statistics Review	Handouts		Project Proposal DUE	
7	M	20-Oct	Lab - VISSIM	Handouts	4 Lab Report	27-Oct	
8	W	22-Oct	Lab - VISSIM	Handouts			
9	M	27-Oct	Guest Lecture			3-Nov	
10	W	29-Oct	Exam				
11	M	3-Nov	Introduction to Transportation Finance, Project Development, and Planning	8.1-8.3	5	10-Nov	
12	W	5-Nov	Trip Generation and Distribution	8.4			
13	M	10-Nov	Brief Introduction to Networks	Handouts	6	17-Nov	
14	W	12-Nov	Mode and Route Choice	8.5-8.9			
15	M	17-Nov	Lab - SAND	Handouts	7 Lab Report	24-Nov	
16	W	19-Nov	Introduction to Freight	Handouts			
17	M	24-Nov	Public Transportation	Handouts	8	1-Dec	
18	W	26-Nov	Safety, Bicycle and Pedestrian Topics	Handouts			
19	M	1-Dec	Project Presentations				
20	W	3-Dec	Project Presentations			Final Report DUE	
21	W	10-Dec	Comprehensive Final Exam: Monday, December 7, 08:00-09:50 see full PSU schedule				

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	30%
Midterm Exam	20%
Group Project	25%
Final Exam	25%

I will drop your lowest homework grade when computing the final grade. If I 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! A grade of incomplete “I” is granted by the instructor *only* with prior approval and consent. Criteria are outlined in the PSU Bulletin.

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/).

Attendance

Attendance is strongly suggested. We will do activities in class that will help in your learning of the material that can not be duplicated outside of the classroom.

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.

For 2009, I will follow the guidance on the “flu” posted here -- <http://www.shac.pdx.edu/> and attached to the syllabus.

Computer and E-mail Accounts

Email is a useful way for us to remain in contact and 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. Use proper grammar, spell check, and proof your message. Expect a response time of 2 working days (plan accordingly).

Please note that the CEE Department now requires communication by the MCECS supported email. 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. I **strongly recommend** forwarding your CECS e-mail to whatever e-mail address you use if you don't like it.

Description of Assignments

Problem Sets (30% of final grade)

Problem sets are 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. Clearly restate the problem and provide your answer. I would greatly appreciate that you staple multiple page assignments.

Exams (45% of final grade)

In this class, there will be two exams. The final exam will be a comprehensive in-class exam. The midterm is intentionally weighted less since it is expected your mastery of the material will increase.

Group Project (25% 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. The following sub-assignments are part of the final project:

Project Proposal (25% of group project grade)

You should treat this assignment like you are responding to a request for proposal (RFP) from your client to do the work. Assume your client has a choice of teams – “sell” yours. Include a cover letter and address both it and the proposal to the client. Briefly describe the topic chosen, provide a review of background information that you have obtained, a description of project objectives, a description of each task, and a schedule with an estimate of hours to complete each task. Include reference documents (i.e design manuals, articles, web sources) that you have reviewed to help you understand the

problem. Proper citation is required. Please be clear on the assignment of tasks to each team member. Each team member must sign the proposal indicating that they agree with the team expectation and policies section of the proposal. A template for the proposal is provided on the class website – 5 pages maximum (not including cover sheet or the team policies and expectations).

Final Presentation (15% of group project grade)

Each group will present a straight-forward summary of their project effort plus their final results during the last class session. Your “client” may be in attendance to help evaluate your presentations. The time allotted to each group will be determined at a later date. All group members should plan to speak. Please be aware that the time will be highly regulated. Please practice – you will not be allowed to exceed your allotted time for any reason.

Final Report (60% of group project grade)

Include a transmittal letter, cover page and standard headings in the final report. The final report is due at the start of the final presentation period. Please do not use any fancy bindings, a staple is enough. The short report (6 page maximum, 1.5 spacing, 12 pt point, 1 in margins, not including cover or appendices) should summarize the project objectives, steps, and outcome. See template on class website.

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.enb.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

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.

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

With the advent of the Internet it is very tempting to think that all necessary resources for a term project will be available in full text after typing in a few words at Google.com. This is not the case. 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.