

Course Number	CE 454 Fall Quarter 2004
Title	Urban Transportation Systems
Section	001
CRN(s)	14468
Credits	4
Design Credits	2.5
Prerequisite(s)	CE 351
Days/Time	Mondays and Wednesdays 8:00-9:50
Location	Science Building 2, Room 155
Final Exam Day/Time	Monday, December 6, 2004, 0800-0950, SB2 Room 155

Course Website <http://www.bertini.org>. A substantial amount of material will be made available to you via the course website (including this syllabus). As the quarter progresses, I will post presentations, homework solutions and relevant links.

Instructor **Dr. Robert L. Bertini, P.E.**
Office **Urban Center, Room 320E and Science Building 2, Room 119**
Phone & Voicemail **503-725-4249**
E-mail **bertini@pdx.edu** (possibly the best way to reach me)
Office Hours _____
and at any other time by appointment or if I'm in the office. You're encouraged to call, email and stop by the office if you need assistance of any kind in this class, other classes, developing your resume, finding internships, jobs, etc.

Mailbox Location CEE Office, Science Building 2, Room 128

Required Text:
Mannering, Fred L. and Kilareski, Walter P. *Principles of Highway Engineering and Traffic Analysis*, 3rd ed., 2004.

Recommended References:

1. Khisty, C. Jotin and Lall, B. Kent, *Introduction to Transportation Engineering*, 2002.
2. Banks, James. *Introduction to Transportation Engineering*, 2nd ed., 2001.
3. *Highway Capacity Manual 2000*, Transportation Research Board, 2000. See Highway <http://www.a3a10.gati.org/?hcm2000> for more information.
4. *Transit Capacity and Quality of Service Manual*, Transit Cooperative Research Program Web Document 6, Transportation Research Board, 1999.
Available free at: <http://www4.trb.org/trb/crp.nsf/All+Projects/TCRP+A-15>
5. *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD 2003), Federal Highway Administration, 2003. Available free at: <http://mutcd.fhwa.dot.gov/>
6. [*A Policy on Geometric Design of Highways and Streets*](#), American Association of State Highway and Transportation Officials (AASHTO Green Book), 2001.

Supplemental Readings: Will be distributed in class.

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.*

Design/Professional:

This course includes 2.5 design credits, and approximately 62.5% of the course covers transportation design principles. In addition, the course focuses on collaborative problem solving issues and includes an introductory session on engineering ethics.

The class is organized into five modules, including: intersection control and design; at-grade intersection capacity and service quality; public transportation; urban transportation planning; and local area traffic management. Students will also work on a group project, under the supervision of the instructor.

Course Objectives – Students must demonstrate the ability to:

1. Comprehend the breadth of transportation planning and engineering.
2. Describe the development phases of a transportation project.
3. Understand the interaction between land use and transportation and how it is modeled.
4. Be familiar with the four classical steps in travel demand forecasting and understand their strengths and weaknesses.
5. Perform basic critical analysis of transportation planning proposals and projects.
6. Perform individual research and communicate to colleagues and instructor.

Course Requirements:

- Lecture materials, handouts, supplemental reading and in-class announcements.
- Assigned readings should be done prior to the relevant class.
- Homework to be done on one side of letter-sized (grid preferred) paper. Use plenty of paper, use legible block lettering and professional presentation standards. It would be great if you staple your un-folded homework in the upper left corner.
- Group project (short oral presentation and concise written report).
- Midterm exams and comprehensive final exam will be open textbook, closed notes.
- All written responses in this course shall be in your own words.

Course Grading

Students will be evaluated on the following course components:

Assignment	Points Assigned or % of Total Grade
Weekly Homework	20%
Midterm 1	20%
Midterm 2	20%
Group Project Report & Presentation	15%
Final Exam	25%
<i>TOTAL</i>	<i>100%</i>

Evaluation

A group rating system will be used to evaluate the relative contribution of each group member. A curve will be used to determine the final course letter grade. Students with disabilities should discuss any arrangements that will enhance their learning in this class with the instructor.

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 in this course.

Incompletes

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

Program requirements

The CEE Department requires that junior and senior engineering courses must be completed with a minimum grade of C-, and a student's cumulative PSU GPA must be 2.25 or higher to graduate from the BSCE program.

REVISED Schedule

No	Date	Topic	3rd Edition		2nd Edition		HW Due
			Reading	Homework*	Reading	Homework*	
1	M9/27	Introduction	Ch 1	Assignment 1	Ch 1	Assignment 1	10/4
2	W9/29	Review: Vehicle Performance Geometric Design Highway Capacity and LOS Elements of Traffic Analysis	Ch 2 Ch 3 Ch 6 Ch 5	2.27, 2.28 3.1, 3.8, 3.26 6.3, 6.6, 6.11 5.3, 5.24, 5.27, 5.29	Ch 2 Ch 3 Ch 7 Ch 5	2.18, 2.20 3.1, 3.7, 3.19 7.3, 7.6, 7.11 5.3, 5.14, 5.17, 5.19	10/6 10/6 10/6 10/13
3	M10/4	<i>Guest Speaker:</i> Peter Mason and Rob Burchfield, City of Portland. Description of Project Topics					
4	W10/6	<i>Guest Speaker:</i> Dr. Chris Monsere, Highway Safety Engineering					
5	M10/11	Intersection Control and Design					Proposal Due
6	W10/13	Intersections continued	Ch 7	7.1, 7.3, 7.15, 7.5, 7.8, 7.37, 7.19	Ch 6	6.1, 6.3, 6.5, 6.7, 6.10, 6.13, 6.17	10/20
7	M10/18	Traffic Analysis at Signalized Intersections <i>Guest Speaker:</i> Hermanus Steyn, Kittelson & Associates					
8	W10/20	Traffic Analysis <i>Guest Speaker:</i> Randy McCourt, DKS Associates	*K&L Ch 9	K&L: 9.5, 9.8, 9.12 using HCS	*K&L Ch 9	K&L: 9.5, 9.8, 9.12 using HCS	11/3
9	M10/25	Examples and Review					
10	W10/27	<i>Midterm 1</i>					
11	M11/1	Urban Transportation Planning Trip Generation	Ch 8	8.1, 8.6, 8.7, 8.12, 8.13, 8.15, 8.17, 8.28	Ch 8	8.1, 8.4, 8.5, 8.10, 8.11, 8.13, 8.15, 8.27	11/10
12	W11/3	Trip Distribution					
13	M11/8	Transportation Facility Design <i>Guest Speaker:</i> Aaron Myton, Oregon DOT					
14	W11/10	Mode Choice and Route Choice					
15	M11/15	Examples and Review					
16	W11/17	<i>Midterm 2</i>					
17	M11/22	Public Transportation	K&L p. 396-427	K&L: 10.4, 10.5, 10.8, 10.12, 10.13	K&L p. 396-427	K&L: 10.4, 10.5, 10.8, 10.12, 10.13	11/24
18	W11/24	Pavements	Ch 4		Ch 4		
19	M11/29	Miscellaneous Topics and Review					
20	W12/1	<i>Project Presentations</i>					Report Due
21	M12/6	<i>Comprehensive Final Exam:</i> 800-950 SB2, Rm 155					

***Note:** homework problems are from Mannering & Kilareski except where designated as K&L, which are from Khisty and Lall.

Computer and Email Accounts

All engineering students should activate their engineering computer account (go to the CadLab in SB2, 169) which will allow them to use engineering computer labs and email. You should activate it *before* the day you need it. If you encounter problems with this account, see the lab attendant, or email: support@cecs.pdx.edu. Please note: the CEE Department regularly sends course announcements, job information, etc. to students' CECS accounts, so if you do not check it regularly, we recommend forwarding your CECS e-mail to whatever e-mail address you use.

Electronic Communication

Email is a useful way for us to remain in contact. I will periodically send reminders, hints and other notices to the class via email. If you use email to communicate with me, I suggest you use proper grammar, spell check, and proofread your message. In order to establish a class email list, please prepare the following letter as Assignment 1:

Assignment 1: Introductory Letter (Due October 4, 2004)

Learning is a cooperative effort. To help me get to know you better, your first assignment will be to write a letter introducing yourself to me. Write the letter in business style in the body of an email message, not as an attachment. Please include the following:

- Who you are.
- What you do (work? hobbies?)
- Academic background.
- Career goals.
- What you want to learn in this class.
- You are welcome to talk this online learning style diagnostic (voluntary):
<http://www.engr.ncsu.edu/learningstyles/ilsweb.html>
If you do, please include a discussion of the results of your learning style inventory.
- Your email address.

Ethics and Professionalism

As future professional engineers you should plan to take the FE Exam (see the Oregon State Board of Examiners for Engineering and Land Surveying at www.osbeels.org), and you should 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.

My philosophy is that students are expected to be responsible for their own actions and to show both within and without the university such respect for order, morality, personal honor and the rights of others as is demanded of good citizens. Students, individually and collectively, will do their share and take an active part in seeing to it that others as well as themselves uphold the spirit and letter of this philosophy.

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 (<http://www.ess.pdx.edu/osa/>).

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): <http://www.asce.pdx.edu>
- Institute of Transportation Engineers Student Chapter (ITE): <http://www.its.pdx.edu/ite/>

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 - <http://www.swe-columbia-river.org>
- Structural Engineers Association of Oregon (SEAO): www.seao.org

Resources

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:

- CE Website (includes program info, job listings, etc.): <http://www.cee.pdx.edu>
- CE Website Job Listings: http://www.ce.pdx.edu/ce_jobs.shtml
- Career Center: <http://www.career.pdx.edu/>
- Academic Advising: <http://www.pdx.edu/advising>
- Center for Student Health & Counseling: <http://www.shac.pdx.edu/>
- The Writing Center: <http://www.writingcenter.pdx.edu/>
- PSU Disability Resource Center: 435 Smith Memorial Union
- Portland CE firms and agencies: <http://web.pdx.edu/~bertini/resources.html>

Many students have internships, summer jobs, etc., so if you have any questions about how to begin the employment search please let me know.

Note: The 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.

Introduction to Library and Literature Research

Be sure to make use of the Vikat library catalog. Go to the PSU library home page at <http://www.lib.pdx.edu/>. Also available on the library home page are Full Text Electronic Journals: <http://www.lib.pdx.edu/~bvws/bytitle.html>, and a list of on-line Databases: <http://www.lib.pdx.edu/resources/databases/databases.html>. Try EI Compendex (<http://www.ei.org/ev2/ev2.home>) and Lexis-Nexis. Note that access to these databases is free for PSU students, but you must be using a computer on campus or via a dial-in service. See <http://www.lib.pdx.edu/services/distance/proxyserver.html> for instructions on how to gain off-campus access using a proxy server.

Group Project Topics

Potential group projects will be discussed on **October 4, 2004**, and will include:

- PSU Campus pedestrian integration plan (Broadway)
- Investigate the turning requirements for WB 67 trucks, and determine the design changes needed at N Portland Blvd and N Interstate Ave if WB 67 trucks were to be accommodated. Detail the tradeoffs involved for pedestrians and bike riders, as well as light rail and passenger vehicles.
- Find driving directions to OMSI on their web site. Use the provided list and map to locate OMSI guide signs. Propose alternative sign locations and/or alternate driving directions.
- Compare crashes on street segments where speed bumps have been in place for 5+ years with control streets to determine if there is a safety benefit.
- Observe driver behavior at different types of uncontrolled pedestrian crossings (unmarked crosswalk, marked crosswalk, marked crosswalk with median, marked crosswalk with curb extension). Observe, document and compare yield behavior of drivers.
- Report on current trends in street design that reduces or slows stormwater runoff. Propose a design for parking lot or other facility at PSU.
- Smith and Bybee Lakes Trail Bridge over the Columbia Slough (design)
- Lake Oswego to Milwaukie RR bridge (would a cantilevered trail bridge for bikes/peds work?)

Group Project Proposal

A proposal from each group is due on **October 11, 2004** and is limited to **one page** (typed/word processed). Please include the following:

- Your names
- Project title
- Brief summary of project objectives in bullet format
- Project methodology, including all anticipated steps and tools necessary to complete the project.
- Project outcome, i.e., what will be the final result of your project.

Project Presentations

Each group will present a straight-forward summary of their project effort plus their final results during the last class session on **December 1**. Your "client" from the City of Portland will be in attendance to help evaluate your presentations. Each group will also be asked to submit a short report (5 page maximum) summarizing your project objectives, steps, and outcome. The paper will be due on Wednesday **December 1, 2004**.

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 (from campus phones dial 5-4404). To dial 911 from a campus phone, you must dial 9-911.