**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  

**Recommended References/Optional Text/Supplemental Readings & Resources:**

**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.
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<thead>
<tr>
<th>#</th>
<th>D</th>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
<th>Problem Set</th>
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<tbody>
<tr>
<td>1</td>
<td>T</td>
<td>1-Oct</td>
<td>Introduction</td>
<td>Lecture Notes</td>
<td>1 Intro Letter</td>
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<td>2</td>
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<td>Human Factors and Traffic Control</td>
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<td>3</td>
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<td>Highway Capacity - Multi and Two-Lane Highways</td>
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<td>6</td>
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<td>Introduction to Simulation and Statistics</td>
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<td>7-Nov</td>
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<td>7.4-7.5</td>
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<td>13</td>
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<td>12-Nov</td>
<td>Level of Service at Signalized Intersections</td>
<td>7.6-7.8</td>
<td>6 LOS Signals</td>
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<td>14</td>
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<td>14-Nov</td>
<td>Introduction to Planning</td>
<td>8.1-8.3</td>
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<td>15</td>
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<td>19-Nov</td>
<td>Trip Generation and Distribution</td>
<td>8.4-8.5</td>
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<td>16</td>
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<td>21-Nov</td>
<td>Mode and Route Choice</td>
<td>8.5-8.9</td>
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<td>17</td>
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<td>Lab - SAND</td>
<td>Lab</td>
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<tr>
<td>19</td>
<td>T</td>
<td>3-Dec</td>
<td>Safety Analysis</td>
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<td>9 SAND LAB REPORT</td>
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<td>21</td>
<td>R</td>
<td>12-Dec</td>
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<td>Final Report DUE</td>
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Final Exam 8:00-9:50AM EB102
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:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percent of Total Grade</th>
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<tbody>
<tr>
<td>Homework and Lab Reports</td>
<td>15%</td>
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<tr>
<td>Participation</td>
<td>5%</td>
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<tr>
<td>Exam 1</td>
<td>30%</td>
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<tr>
<td>Group Project</td>
<td>20%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
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</tbody>
</table>

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 in 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.stepgroups.pdx.edu/
- Engineers Without Borders http://www.ewb.pdx.edu/
- Student Water Resources Group http://www.swrggroups.pdx.edu/
- Chi Epsilon Civil Engineering Honor Society http://web.cecs.pdx.edu/~ceehonor/
- 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](http://www.seao.org)
- Women’s Transportation Seminar, Portland Section: [wtsinternational.org](http://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/](http://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](http://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/](http://www.cee.pdx.edu/)
- Career Center: [www.career.pdx.edu/](http://www.career.pdx.edu/)
- Center for Student Health & Counseling: [www.shac.pdx.edu/](http://www.shac.pdx.edu/)
- The Writing Center: [www.writingcenter.pdx.edu/](http://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/](http://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.