

UTRGV
COURSE SYLLABUS

CIVE 6354 Advanced Transportation Engineering

Dr. Mohamadossein Noruzoliaee, Ph.D.

Fall 2019

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Class times & location: TR 18:30-19:45 EMAGC 2.210

Office hours & location: TR 16:00-17:15 (or by appointment) EPOB10 1.104D

Textbook and/or Resource Material

The course materials will be provided and presented in the class, including but not limited to:

Ortúzar, Willumsen, *Modeling Transport, 4th Edition*, Wiley, 2011, [ISBN: 9780470760390], [eText ISBN: 9781119993308], Available at <https://onlinelibrary.wiley.com/doi/book/10.1002/9781119993308>.

Course Description and Prerequisites

Theory and practice in transportation decision-making, planning, and modeling; advanced concepts of the transportation mathematical modeling: optimization and statistics; comprehensive presentation of trip-based models for transportation demand analysis and forecast; trip generation models; trip distribution models; trip mode choice and discrete choice models; trip assignment and network modeling; introduction to tour- and activity-based models for transportation demand analysis.

Learning Objectives/Outcomes for the Course

1. Introduces transportation engineering within the broader field of civil engineering
2. Introduces fundamentals of transportation decision-making, planning, and modeling
3. Introduces mathematical prerequisites for transportation modeling: optimization and statistics
4. Introduces trip-based four-step models for transportation demand modeling: trip generation, distribution, mode choice, and assignment (network modeling) models
5. Introduces tour-based and activity-based models for transportation demand modeling

Students' learning will be assessed by homework, quizzes, term project, midterm examination, final examination, and active attendance.

Learning Objectives for Core Curriculum Requirements

The course objects match the set outcomes by the Texas Higher Education Coordinating Board (THECB) and the Department of Civil Engineering.

1. Critical Thinking Skills- an ability to identify, formulate, and solve engineering problems;
2. Empirical and Quantitative Skills- an ability to apply knowledge of mathematics, science, and engineering; a knowledge of real-world issues; an ability to use the techniques, skills, and technological engineering tools necessary for engineering practice
3. Communication Skills- an experience of being a team member to solve a real-world problem

Grading Policies

A total of 100 points, as explained below. Note: $A > 90$, $80 < B < 89$, $70 < C < 79$, $60 < D < 69$

Homework (24 points): A total of 6 homework, each 4 points. Homework is due 1 week after the assigned date unless otherwise informed in the class. No exception on late submission.

Quizzes (10 points): A total of 2 quizzes, each 5 points. Schedules and topics of quizzes are according to the course timeline table unless otherwise informed in the class at least 10 days before the quiz for your preparation and attendance.

Term project (16 points): Will be assigned in the weeks 3-4. The final products include an interim term project presentation (4 points), a final term project presentation (6 points), and a final written report (6 points).

Examinations (45 points): 1 midterm exam in the 10th week (15 points) and 1 final exam (30 points). There will be in-class reviews before the two exams.

Attendance (5 points): Active class attendance is required. Sign-in sheets will be handed out for randomly selected sessions. Any student with more than 3 absences without pre-excuse will be dropped from the class.

Calendar of Activities

Course and evaluation timeline (tentative)

| Week | Date | Topic | Homework (HW) |
|------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1 | Aug 27 Aug 29 | Introduction to Transportation Engineering | |
| 2 | Sep 03 Sep 05 | Overview of transportation decision-making, planning, and modeling (Chapter 1) Term project discussion | |
| 3 | Sep 10 Sep 12 | Mathematics of transportation modeling: Introduction to optimization (Chapter 2) | HW #1 out |
| 4 | Sep 17 Sep 19 | Mathematics of transportation modeling: Introduction to statistics (Chapter 2) | HW #1 due , HW #2 out |
| 5 | Sep 24 Sep 26 | Transportation demand modeling: overview of classical trip-based four-step models Trip generation models (Chapters 4.1-4.2) | HW #2 due |
| 6 | Oct 01 Oct 03 | Trip generation models (Chapters 4.3-4.7) Quiz 1 (of topics from Aug 27 to Oct 01) + solving quiz questions | HW #3 out |
| 7 | Oct 08 Oct 10 | Trip distribution (Chapters 5.1-5.2) Trip distribution (Chapter 5.3) | HW #3 due HW #4 out |
| 8 | Oct 15 Oct 17 | Trip mode choice & discrete choice models (Chapters 6, 7.1-7.2) Trip mode choice & discrete choice models (Chapter 7.3) | HW #4 due |
| 9 | Oct 22 Oct 24 | Trip mode choice & discrete choice models (Chapters 7.4-7.7, 8) Trip mode choice & discrete choice models (Chapter 9) Review for midterm | HW #5 out |
| 10 | Oct 29 Oct 31 | Midterm exam (of topics from Aug 27 to Oct 24) Interim term project presentations | HW #5 due |
| 11 | Nov 05 Nov 07 | Trip assignment & network modeling (Chapters 3.5, 10.1) Trip assignment & network modeling (Chapters 10.2-10.4) | |
| 12 | Nov 12 Nov 14 | Trip assignment & network modeling (Chapter 10.5, 10.7) Transportation demand modeling: overview of tour-based and activity-based models | HW #6 out |
| 13 | Nov 19 Nov 21 | Quiz 2 (of topics from Nov 05 to Nov 14) + solving quiz questions Term project presentations | HW #6 due |
| 14 | Nov 26 Nov 28 | Term project reports due Thanksgiving Holiday (No classes) | |

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|----|--------|------------------------|--|
| 15 | Dec 03 | Review for final exam | |
| | Dec 05 | Study day (No classes) | |

The UTRGV academic calendar can be found at <https://my.utrgv.edu/home> at the bottom of the screen, *prior to login*. Some important dates for Fall 2019 include:

- August 26 First day of classes
- August 29 Last day to add a course or register for Fall 2019
- September 2 Labor Day Holiday – NO classes
- November 13 Last day to drop a course; will count toward the 6-drop rule
- November 28 - 29 Thanksgiving Holiday – NO classes
- December 5 Study Day – NO classes
- December 6 - 12 Final Exams
- December 13 - 14 Commencement Exercises

UTRGV Policy Statements

STUDENTS WITH DISABILITIES:

Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact **Student Accessibility Services (SAS)** as soon as possible to schedule an appointment to initiate services. Accommodations can be arranged through SAS at any time, but are not retroactive. Students who experience a broken bone, severe injury, or undergo surgery during the semester are eligible for temporary services.

Pregnancy, Pregnancy-related, and Parenting Accommodations

Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to contact Student Accessibility Services for additional information and to request accommodations.

Student Accessibility Services:

Brownsville Campus: Student Accessibility Services is located in 1.107 in the Music and Learning Center building (BMSLC) and can be contacted by phone at (956) 882-7374 or via email at ability@utrgv.edu.

Edinburg Campus: Student Accessibility Services is located in 108 University Center (EUCTR) and can be contacted by phone at (956) 665-7005 or via email at ability@utrgv.edu.

MANDATORY COURSE EVALUATION PERIOD:

Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (<http://my.utrgv.edu>); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available on or about:

| | |
|--------------------|------------------------------------------------------|
| Module 1 | October 2 nd – 8 th |
| Module 2 | November 27 th – December 3 rd |
| Full Fall Semester | November 14 th – December 4 th |

ATTENDANCE:

Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV's attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

SCHOLASTIC DISHONESTY:

As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism (including self-plagiarism), and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to Student Rights and Responsibilities.

SEXUAL MISCONDUCT and MANDATORY REPORTING:

In accordance with UT System regulations, your instructor is a "Responsible Employee" for reporting purposes under Title IX regulations and so must report to the Office of Institutional Equity & Diversity (oie@utrgv.edu) any instance, occurring during a student's time in college, of sexual misconduct, which includes sexual assault, stalking, dating violence, domestic violence, and sexual harassment, about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity,

including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct, discrimination, and all forms of violence. If students, faculty, or staff would like confidential assistance, or have questions, they can contact OVAVP (Office for Victim Advocacy & Violence Prevention) at 665-8287, 882-8282, or OVAVP@utrgv.edu.

COURSE DROPS:

According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

STUDENT SERVICES:

Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Students Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (888) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor’s office hours. University Resources include the Advising Center, Career Center, Counseling Center, Learning Center, and Writing Center. The centers provide services such as tutoring, writing help, critical thinking, study skills, degree planning, and student employment. Locations are:

| Center Name | Brownsville Campus | Edinburg Campus |
|------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|
| Advising Center AcademicAdvising@utrgv.edu | BMAIN 1.400 (956) 665-7120 | ESWKH 101 (956) 665-7120 |
| Career Center CareerCenter@utrgv.edu | BCRTZ 129 (956) 882-5627 | ESSBL 2.101 (956) 665-2243 |
| Counseling Center Counseling@utrgv.edu | EUCTR 109 (956) 665-2574 | BSTUN 2.10 (956) 882-3897 |
| Learning Center LearningCenter@utrgv.edu | BMSLC 2.118 (956) 882-8208 | ELCTR 100 (956) 665-2585 |
| Writing Center WC@utrgv.edu | BUBLB 3.206 (956) 882-7065 | ESTAC 3.119 (956) 665-2538 |