

UTRGV
COURSE SYLLABUS

CIVE 6399 Infrastructure Asset Management
Spring 2020

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Class times & location: MW 17:00-18:15 (EMAGC 1.212)

Office hours & location: MW 12:30-13:45 (EPOB10 1.104A)

Textbook and/or Resource Material

The course materials will be provided and presented in the class.

Course Description and Prerequisites

The focus of the course is on the statistical, optimization, and artificial intelligence methods and their application to the inspection, performance prediction, and maintenance decision making for the management of transportation infrastructure systems (such as roads, bridges, airports, rail tracks, etc.).

Learning Objectives/Outcomes for the Course

1. Introduces transportation infrastructure management systems with both finite and infinite horizons
2. Introduces fundamentals of statistical, econometric, and artificial intelligence (AI)-based methods for making inferences about infrastructure performance
3. Introduces fundamentals of dynamic programming, optimization, and AI-based methods for making decisions to upkeep transportation infrastructure systems

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

Learning Objectives for Core Curriculum Requirements

The course objectives 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 (30 points): A total of 3 homework, each 10 points. Homework is due 2 weeks after the assigned date unless otherwise informed in the class. No exception on late submission.

Term paper project (30 points): The final products include an interim term paper project presentation (5 points), a final term project presentation (5 points), and a final written report (20 points). No teamwork. Further details will be discussed in the class.

Examination (35 points): 1 final exam (35 points). There will be an in-class review before the final exam.

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	Jan 13	Introduction to infrastructure asset management	
	Jan 15		
2	Jan 20	Martin Luther King Jr. (No classes)	
	Jan 22	Infrastructure management systems (IMs): Overarching framework	
3	Jan 27	Infrastructure performance	
	Jan 29	Dynamic Programming, Markov Chain, and Markov Decision Processes	
4	Feb 3		
	Feb 5		
5	Feb 10	Joint M&R and Inspection Decision	HW1 out
	Feb 12		
6	Feb 17	Infinite Horizon Decision Problems	
	Feb 19		
7	Feb 24	System Level Decision Problems	HW1 due
	Feb 26		HW2 out
8	Mar 2	Interim term paper presentations	
	Mar 4		
9	Mar 9	Joint Deterioration and Maintenance Models	
	Mar 11		HW2 due
10	Mar 16	Stochastic Duration Models	
	Mar 18		HW3 out
11	Mar 23	Stochastic Discrete Deterioration Models	
	Mar 25		
12	Mar 30	Data Truncation and Censoring	
	Apr 1		HW3 due
13	Apr 6	Artificial Intelligence (AI) applications in IMS	
	Apr 8		
14	Apr 13		
	Apr 15		
15	Apr 20	Term paper presentations	
	Apr 22		
16	Apr 27	Review for final exam+ Final written report of term paper	
	Apr 29		

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 Spring 2020 include:

January 13	First day of classes
January 16	Last day to add a course or register for Spring 2020
January 20	Martin Luther King Jr. – NO classes
April 9	Last day to drop a course; will count toward the 6-drop rule

April 30
May 1 - 7
May 8 - 9

Study Day - NO classes
Final Exams
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	February 19 – 25
Module 2	April 15 – 21
Full Spring Semester	April 10 – 29

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