

The University of Texas at El Paso
Department of Civil Engineering

CE6306 Infrastructure Engineering (CRN 18772)

Course Syllabus (Fall 2018)

Version Date: 8/25/2018

Time & venue	Class times: MW, 3:00 p.m. to 4:20 p.m., CRBL 204
Instructor	Dr. Ruey (Kelvin) Cheu Office: Engineering Annex Room A208 Email: rcheu@utep.edu Phone: (915)747-5717 Office hours: MTWR 1:30 p.m. to 3:00 p.m.
Teaching assistant	None
Course website	See Blackboard
Course objective	In UTEP course catalog: “This course introduces systems concepts and tools in engineering civil infrastructure. Technical topics are grouped into 3 parts: infrastructure location; infrastructure capacity analysis; and decision analysis. The infrastructure location analysis addresses the issue on where to locate/site an infrastructure facility (e.g. transportation terminals, water/wastewater treatment plants, schools, and etc.). The capacity analysis covers the analysis of a facility’s capacity and for infrastructure systems that spread over a network (e.g. transportation, water distribution, sewage, storm water), the capacity and distribution of materials across a network.”
Pre-requisite	No pre-requisite, but students are expected to have some background in - Linear programming - Probability and statistics
Textbook	No required textbook. Reference books, not required, but excellent books to have are: 1. Taha, H. A., 2007. Operations Research: An Introduction. Prentice Hall. 2. Daskin, M. S., 1995. Network and Discrete Location. John Wiley. These books are not available in UTEP Bookstore, but can be purchased over the internet.

Grading	<p>Contributions towards final mark (out of 100%)</p> <ul style="list-style-type: none"> 10% Class attendance 15% Exam 1 15% Exam 2 15% Exam 3 15% Homework 10% Topical presentation 10% Project 1 10% Project 2 <p>Letter grades will be assigned based on the final course marks:</p> <ul style="list-style-type: none"> A 90 and above B 80 to 89.99 C 70 to 79.99 D 60 to 69.99 F below 60 <p><i>“If A is 90 and above, a student who has 89.99 total marks at the end of the semester should get a B. He or she has no excuse to get an A.”</i> Richard Jarvis, former Provost of UTEP.</p>
Exams	Exams will be given during the class times. The dates and topics to be tested will be announced in the class one week prior to the exam. All the exams are closed book.
Final Exam	See above. There is no exam during the final week. The time slot will be used for presentation.
Portfolio	Not required.
Homework	<p>The homework problems will be assigned at the completion of a topic and will be due in class on the day stated in the homework sheet. All homework problems will be graded. Homework solutions will be discussed in subsequent classes.</p> <p>In all your homework and exam solutions, you are expected to present, in written form (typed, printed or hand written notes), the formulae used, the variable values, intermediate calculation, final answers and their units. No having any of the above will lead to marks being deducted.</p>
Topical presentation	At the end of 3 rd week, each student will propose/select a topic for presentation in the class. The purpose of this is to train students to learn a relatively advanced topic on his/her own, and to teach fellow classmates. The duration of the presentations depends on the class

	size. The dates of presentations will depend on the topic of interest, to fit the class schedule.
Late homework/ assignment policy	Late homework is normally accepted with the following policy used by EPISD: Late by ≤ 24 hours: 70% credit Late by > 24 hours but ≤ 48 hours: 50% credit Late by > 48 hours: 0% credit.
Re-schedule of exams	Make-up for exams will only be arranged if you inform the instructor prior to the exam, with a valid reason. Examples of valid reasons are child birth, illness, passing of an immediate family member, court appearance, and travel for official UTEP business. They are not expected or cannot be rescheduled. You may be required to show evidence for the valid reason. Events that can be pre-scheduled or rescheduled are not considered valid reasons. Examples of non-valid reasons are bridge delay, wedding, driving test, clash in course schedule, and etc. Job interview will be considered on a case by case basis. If an emergency happens during the exam day, you should contact the instructor at the earliest possible time (or contact one of your classmates who will then inform the instructor).
Collaboration/ cheating	Being a PhD course, the assignments and homework are challenging. Discussions between classmates on homework are strongly encouraged. However, the written work submitted must be your own effort (in your own words and your own style). Directly copying someone else's work is cheating. Any case of suspected cheating will be reported to the Dean of Students, which may lead to you getting an F grade in this course, suspension in the program of study and/or dismissal from UTEP. Additional note: I have ZERO tolerance on plagiarism, especially for a PhD course taken mostly by students who are doing thesis and dissertation. This is because any unethical conduct in class work will be repeated in research (e.g., faking data, did not cite reference, lying to supervisor, using supervisor's name in letter or paper w/o permission). Academic honesty is the #1 requirement for research students.
Audio/video recording	Recording of class instructions by any audio or video device is not permitted. The only exception is at the request of the Center for Accommodation and Support Services, or at the request of Department, College or University for teaching evaluation.
Cell phone policy	Please turn off your cell phone or switch it to silent mode during class time. If you need to answer a phone call, please leave the class quietly

	and only answer “Hello” or “Bueno” outside the class door. You are not allowed to answer any phone call during the examination.
Disability	If you have any disability and you need special assistance in taking this course, please contact the Center for Accommodations and Support Services (CASS), formerly known as Disable Student Service at Union East. Your identity will be kept confidential.

Suggested Topics for Presentations

- Probabilistic facility location models
- Spatial and temporal queuing models
- Demand forecasting models
- Time series models
- Infrastructure inspection, health assessment, risk/security analysis
- Environmental impact assessment (EIA)
- Discrete event and Monte-Carlo simulations
- Leadership in Energy & Environmental Design (LEED)
- Climate change on infrastructure
- Infrastructure resilience
- Infrastructure performance measures
- Infrastructure project financing
- ASCE sustainability scoring system
- Infrastructure and community health
- Other relevant topics approved by the instructor

Students are free to propose his/her own topic, related to thesis/dissertation.

The presentation should cover (1) the definition, basic concepts and models; and (2) application examples in civil or infrastructure engineering. Optional but strongly encouraged points are: brief history, famous researchers and university labs well known on this topic, major journals, classic introductory reading materials.

Tentative Weekly Schedule

The dates of the exam are tentative.

Wk	Date	Topic
1	8/27, 8/29	Course introduction Civil infrastructure characteristics America's infrastructure report card Infrastructure capacity: queuing models
2	9/3, 9/5	9/3 Labor Day - no class Infrastructure capacity: queuing models
3	9/10, 9/12	Infrastructure capacity: queuing models
4	9/17, 9/19	9/17: Do Project 1 Infrastructure capacity: queuing models
5	9/24, 9/26	Infrastructure capacity: network models 9/26: Guest presentation by Matt Vechione (CAOE)
6	10/1, 10/3	10/1: Do Project 1 10/3: Exam 1 (queuing models) by Dr. Esmaeil Balal
7	10/8, 10/10	Infrastructure capacity: network models
8	10/15, 10/17	Infrastructure capacity: network models
9	10/22, 10/24	Infrastructure capacity: network models
10	10/29, 10/31	Infrastructure capacity: network models Infrastructure location: review of linear programming
11	11/5, 11/7	Infrastructure location: covering model 11/7: Exam 2 (network models) by Dr. Esmaeil Balal
12	11/12, 11/14	11/12: Introduction to SIMIO by Matt Vechione 11/14: SIMIO lab session by Matt Vechione
13	11/19, 11/21	Infrastructure location: covering model 11/22-23 Thanksgiving Holiday
14	11/26, 11/28	Infrastructure location: covering model
15	12/3, 12/5	12/3: Exam 3 (location models) 12/7 Dead Day
16	12/10	Presentations (during final exam time 1:00pm-3:45pm)