CE 430: SUSTAINABLE TRANSPORTATION

Term:	**FALL 2024, Section 29625**
Units:	**2**
Day:	**Friday 10:00-11:50am Pacific Time**
Location:	**RTH115**

Instructor:	**Eric C. Shen, P.E., PTP, CPE**
	Adjunct Professor of Civil & Environmental Engineering Practice
Office:	Virtual Office
Office Hours:	TBD
Contact Info:	ericshen@usc.edu

University Catalogue Description

Methods to apply sustainability practices building and maintaining transportation infrastructure. Interrelation between innovation, policies, and regulations to improve mobility services while reducing environmental impact.

Expanded Course Description

Transportation is the largest source of carbon emissions in the U.S. While much effort has been made to improve vehicle and fuel efficiency, the need for building context-sensitive infrastructure in concert with appropriate land use policies and behavior changes are equally important for achieving a sustainable transportation system. This course will explore both technological and non-technological strategies, policies, and regulations affecting infrastructure design, construction, operations, and maintenance; users' behaviors; and modal selections based on the Southern California transportation system.

Learning Objectives and Outcomes

Course materials will be readily available through real-world transportation principles and practices throughout Southern California.

At the end of this course, students will be able to:

- Identify past and current methods to construct and maintain transportation infrastructure.
- Compare varies solutions in addressing the life cycle of different transportation assets.
- Interpret policy options that affect users' travel including alternative modes and micro mobility options.
- Examine other factors that impact future infrastructure development; and produce a comprehensive report using "problem-based learning approach", that recommends sustainable practices in constructing or maintaining an infrastructure.

Prerequisite(s): None
Co-Requisite(s): N/A
Concurrent Enrollment: N/A
Recommended Preparation: Transportation on the level of CE 471 or PPD 360.

Course Notes

Lectures are highly interactive and focused on "real-world" issues. Actual reports and case studies will form the basis for review and plan of actions. **Verbal communications and technical writing** will be emphasized throughout the course.

Technological Proficiency and Hardware/Software Required

The following software packages maybe used in this course:

- Highway Capacity Software
- Synchro (http://www.trafficware.com/synchro.htm)
- Geographical Information System (GIS)
- Other as appropriate

Optional Readings and Supplementary Materials

- Traffic Engineering (5th Edition) Roger P. Roess, Elena S. Prassas, William R. McShane [ISBN 9780134599717]
- An Introduction to Sustainable Transportation: Policy, Planning and Implementation 1st Edition. Preston L. Schiller [ISBN 978-1844076659]
- Travel Matters: Mitigating Climate Change with Sustainable Surface Transportation. Transit (TCRP): TCRP Report, Transportation Research Board (https://www.trb.org/publications/tcrp/tcrp_rpt_93.pdf)
- Additional materials to be provided throughout the course

Description and Assessment of Assignments

This two-unit class will include lectures, field trips, guest speakers, written technical reports and independent research reports. Please submit your assignments via BrightSpace.

- **Individual Assignments:**
  - Four written reports in technical memorandum format are assigned
  - Due date for each assignment is specified in the syllabus

- **Team Project – See instructions**

- **Mid-Term and Final Exams**
  - Both mid-term and final exams will be both qualitative, i.e., articulating your logic and recommendations in a professional manner, and cumulative of the material covered in the course.

Grading Breakdowns

Individual Assignments (10% for each assignment)	40%
Team Project (20% Progress Report; 20% for the final report and contents)	40%
Mid-term Exam	10%
Final Exam	10%
TOTAL	**100%**

Assignment Rubrics: N/A. Letter Grade. Late submission, even by 1 minute, will receive deduction in grade. Repeated late submissions could impact your final grade.

Assignment Submission Policy
All assignments are submitted via email (to ericshen@usc.edu) by the due date/time in PDF format unless otherwise instructed.

Grading Timeline
The standard turn-around for receiving feedback/grade on each assignment/report is 7 days unless otherwise specified.

Course Schedule: A Weekly Breakdown

IMPORTANT:
In addition to in-class contact hours, all courses must also meet a minimum standard for out-of-class time, which accounts for time students spend on homework, readings, writing, and other academic activities. **For each unit of in-class contact time, the university expects two hours of out of class student work per week over a semester.**

	Topics/Daily Activities	Assignments	Due Dates/Reminder
Week 1 8/30/2024 (1h50m)	Course overview. Basic concepts and physical components of transportation systems	Self-intro: bio, resume, and career interest	5PM Pacific Time on WEDNESDAY 8/28/2024
Week 2 9/6/2024 (1h50m)	Sustainable Community & Complete Street – Goals, Policies vs Implementation	Individual Assignment #1	5PM Pacific Time on SUNDAY 9/15/2024
Week 3 9/13/2024 (1h50m)	Inter-relations and inter-dependence between land use, policies, funding, and transportation Pre-tour #1 briefing: Public transit agency's O&M		
Week 4 9/20/2024 (4 hrs.)	Mandatory Technical Study Tour #1	Individual Assignment #2	5PM Pacific Time on SUNDAY 9/22/2024
Week 5 9/27/2024 (1h50m)	Infrastructure Planning and Delivery Pre-tour #2 briefing: Construction Management		
Week 6 10/4/2024 (4 hrs.)	Mandatory Technical Study Tour #2	Individual Assignment #3	5PM Pacific Time on SUNDAY 10/6/2024
Week 7 10/11/2024	No Class FALL RECESS		
Week 8 10/18/2024 (1h50m)	Infrastructure Development: Room for improvement? Guest Speaker(s) - TBD	Mid-term Exam	

	Topics/Daily Activities	Assignments	Due Dates/Reminder
Week 9 10/25/2024 (1h50m)	Project Delivery Operations and Maintenance Pre-tour #3 briefing: Overview of Supply Chain and Freight Delivery		
Week 10 11/1/2024 (4hrs.)	Mandatory Technical Study Tour #3 Port of Los Angeles Harbor Boat Tour	Individual Assignment #4	5PM Pacific Time on SUNDAY 11/8/2024
Week 11 11/8/2024	No Class due to Professor Shen's Work Travel		
Week 12 11/15/2024 (1h50m)	Transportation System Management and Integration Smart City Technologies		
Week 13 11/22/2024 (1h50m)	Land use policies, incentives, and public investment on EV charging, alternative fuels, and home building		
Week 14 11/29/2024 (1h50m)	No Class Thanksgiving Holiday		
Week 15 12/6/2024 (1h50m)	Team Project: Presentation Last Day of Class		
TBD	**Final Exam**		

Additional Policies

Students shall not s solely rely on Wikipedia for reference. When necessary, attempt to contact public agencies or private companies to inquire about relevant information for completing your individual project or group project. That is part of your "real-world" training. Students are expected to participate in course discussion enthusiastically; communicate with lecturer (in person, via email, Zoom, or voice call) openly; respond to assignments/inquires promptly; and collaborate/coordinate/cooperate with team members. These are fundamental skills in the workplace.

Policy on the use of Artificial Intelligence (AI) Generators in CE430 Sustainable Transportation

Using Generative AI in research and to facilitate technical write-ups is an unavoidable trend. Nevertheless, students must demonstrate full understanding of their own writing submissions.

I expect that you will use AI (e.g., ChatGPT and image generation tools) in this class. Learning to use AI is an emerging skill. Keep in mind the following:

- AI tools are permitted to help you brainstorm topics or revise work you have already written.

- If you provide minimum-effort prompts, you will get low-quality results. You will need to refine your prompts to get good outcomes. This will take work.
- Consider the appropriateness of using AI for each assignment or circumstance.
- Proceed with caution when using AI tools and do not assume the information provided is accurate or trustworthy. If it gives you a number or fact, assume it is incorrect unless you either know the correct answer or can verify its accuracy with another source.
- You will be responsible for any errors or omissions provided by the tool. It works best for topics you understand.
- The use of AI tools requires attribution. You'll need to disclose the prompts you used to obtain the results. Failure to do so is a violation of academic integrity policies.

Here are examples of using ChatGPT related to the course topics:

- "Prepare a 1,000 words write-up on the impact on transportation infrastructure due to global warming."
- "Write a script on seaport automation and its impact on organized labor workforce."
- "Recommend up to five strategies for a local city to deploy sustainable transportation operations."

Please ask me if you are unsure about what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Collaboration. In this class, you are expected to submit work that demonstrates your individual mastery of the course concepts.

Group work. Unless specifically designated as a 'group project,' all assignments are expected to be completed individually.

Computer programs (if used). Plagiarism includes the submission of code written by, or otherwise obtained from someone else.

If found responsible for an academic violation, students may be assigned university outcomes, such as suspension or expulsion from the university, and grade penalties, such as an "F" grade on the assignment, exam, and/or in the course.

SCHOOLWIDE POLICIES, EXPECTATIONS AND RESOURCES

Lecturer's Expectations: Please participate in course discussion enthusiastically; communicate with me (in person, via email or phone call or zoom) openly; respond to my assignments/inquiries promptly; and collaborate, coordinate, cooperate with your team members. These are fundamental skills in the workplace.

Etiquette - Expected Social Behavior

1. **Be on time** - We will begin each class promptly at 10am Pacific Time, unless otherwise instructed.
2. Present yourself in a professional manner. This course is part of a professional degree program and students are expected to act and present themselves professionally. Adhere to

the same standard of behavior in the classroom and online (office-hour) as you would at work.
3. Speak in a professional manner: e.g., use neutral language, avoid labels and stereotypes or overgeneralizations about groups/populations.
4. Promote participation and foster respect among fellow students.
5. Every student is encouraged to participate actively in breakout discussion.
6. When joining in discussion, provide thoughtful, succinct, and non-argumentative contributions to the discussion.
7. No multitasking in class!

STATEMENT ON ACADEMIC CONDUCT AND SUPPORT SYSTEMS

Academic Integrity (Updated 8/19/2024)
The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the USC Student Handbook. All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

Academic dishonesty has a far-reaching impact and is considered a serious offense against the university. Violations will result in a grade penalty, such as a failing grade on the assignment or in the course, and disciplinary action from the university itself, such as suspension or even expulsion.

For more information about academic integrity see the student handbook or the Office of Academic Integrity's website, and university policies on Research and Scholarship Misconduct.

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment or what information requires citation and/or attribution.

Students and Disability Accommodations
USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the

semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:
Counseling and Mental Health - *(213) 740-9355 – 24/7 on call*
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

988 Suicide and Crisis Lifeline - *988 for both calls and text messages – 24/7 on call*
The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

Relationship and Sexual Violence Prevention Services (RSVP) - *(213) 740-9355(WELL) – 24/7 on call*
Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - *(213) 740-5086*
Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - *(213) 740-5086 or (213) 821-8298*
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - *(213) 740-0776*
OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - *(213) 740-0411*
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - *(213) 740-2101*
Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - *UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - *UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call*
Non-emergency assistance or information.

[Office of the Ombuds](#) - *(213) 821-9556 (UPC) / (323-442-0382 (HSC)*
A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - *(323) 442-2850 or* otfp@med.usc.edu
Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.