

CE 536 – Future of Mobility

Instructor: Roxana Javid, Ph.D.
Office: KAP 200A
Email: rjavid@usc.edu
Office Hours: TBA

Units: 4
Term: Spring
Schedule: Tue-Thu 1:00-2:50 pm
Location: TBA
Teaching Assistant: NA

Catalogue Course Description

Transforming transportation with technological advancements, implementing smart mobility solutions to enhance transportation efficiency, sustainability, and equity, and measuring network performance with regional mobility indicators.

Expanded Course Description

The course covers a range of modern innovations in mobility and provides students with a deep understanding of the fast-changing world of smart transportation. Throughout the course, students will explore exciting solutions like self-driving cars, electric planes, and sustainable infrastructure. This knowledge will give students a strong grasp of the technology, rules, and sustainability factors driving the future of transportation.

Learning Objectives and Outcomes

By the end of this course, students should be able to:

- Demonstrate the application of smart transportation concepts to real-world scenarios, considering technological advancements and regulations.
- Evaluate the impacts of emerging technologies on transportation efficiency, safety, and sustainability.
- Measure various aspects of mobility using different mobility indicators across different modes of transportation.
- Design mobility solutions that address accessibility, sustainability, and equity to enhance urban and regional transportation networks.

Prerequisite(s): None

Co-Requisite(s): None

Concurrent Enrollment: None

Recommended Preparation: Previous coursework in transportation is not required, but exposure to an introductory transportation at the level of CE 471 would be beneficial.

Course Notes

All course materials — including discussions, lecture slides, assignments, solutions, and scores — will be posted online.

Required Textbook

This course does not require a textbook. All necessary materials will be provided through open educational resources (OER) and the instructor's handouts available online.

Description and Assessment of Assignments

The following components are used to assess the outcomes:

Homework (25%): At the end of each topic, homework will be available, they are due one week from the assignment date, unless otherwise indicated. There are a total of 5 homework assignments. Students are expected to complete all homework assignments on time. Late assignments are accepted with a 20% penalty only for up to 24 hours after the due date; a submission after 24 hours will receive no credit. Homework must be electronically submitted to Brightspace, clearly handwritten or typed and show all work. Homework should be solved independently. If there is any evidence of cheating, relevant University policies and regulations will be applied. Homework will be graded based on organization, neatness, accuracy, and effort.

Class Assignments (25%): Class activities are evaluated using class assignments, which will be assigned during the last 30 minutes of class every 2-3 weeks and are due by end of the class day. Time is allotted during each class period to discuss and solve the class assignment questions. Late assignments are accepted with a 20% penalty only for up to 24 hours after the due date; a submission after 24 hours will receive no credit. Grades will be based on the involvement in these class activities and the quality of the solutions.

Mid-Term Exam (25%): There will be one close-book midterm exam held during our regularly scheduled class time on *week 7th*. In case the midterm exam is missed, an official, acceptable, and verified excuse must be presented to be able to make up the exam as early as possible. This excuse must be recorded within 24 hours. An unexcused failure to take the exam will result in a zero for the exam.

Term Paper (25%): Students are required to complete a group research paper. The topic can be chosen from a list of proposed research topics. Students are also welcome to suggest their own topic title, but the instructor must approve this. Term paper milestones consist of three tasks, a presentation and a final paper report, each accounting for 5% of the course grade. The term paper tasks 1, 2, and 3, as well as the final paper draft, will have the same score for all group members. However, for the presentation, each group member will receive an individual score based on their performance. Instructions, deadlines, and feedback will be provided to students for each task throughout the course. Late submissions are subject to a 20% penalty if received within 24 hours after the due date; submissions beyond this timeframe will not receive credit. The final paper (3500-5000 words) should adhere to academic standards with in-text citations and must be submitted during the week of the final exams. All groups are required to present their research findings and share results with the class on the last day of the course; participation in the final research presentation is mandatory for all group members. Further details can be found in the term paper description located at the end of the syllabus.

Term paper milestone	Share of the total grade	Timeline
Task 1	5%	Assigned week 5 and due week 8
Task 2	5%	Assigned week 9 and due week 11
Task 3	5%	Assigned week 13 and due week 15
Presentation	5%	Due last day of the class
Final paper	5%	Due on the exam day assigned to the course
Total	25%	

Academic Integrity

Unless otherwise noted, this course will follow the expectations for academic integrity as stated in the [USC Student Handbook](#). The general USC guidelines on Academic Integrity and Course Content Distribution are provided in the subsequent “Statement on Academic Conduct and Support Systems” section.

Use of Generative AI in this Course

Generative AI permitted but limited as follows: In this course, you are permitted to use artificial intelligence (AI)-powered programs to help you, but only on “Class Assignments”, which explicitly indicate a permitted use of AI. However:

- You should also be aware that AI text generation tools may present incorrect information, biased responses, and incomplete analyses; thus, their answers may not meet the standards of this course.
- To adhere to our university values, *you must cite any AI-generated material (e.g., text, images, and other content) included or referenced in your work and provide the prompts used to generate the content.* Using an AI tool to generate content without proper attribution will be treated as plagiarism and reported to the Office of Academic Integrity.

Please review the instructions in each assignment for more details on how and when to use AI Generators for your submissions.

Grading Breakdown

Final grades will be calculated as follows:

Assignment	% of Grade
Homework	25%
Class Assignments	25%
Mid-term Exam	25%
Term Paper	25%
TOTAL	100%

Course Schedule: A Weekly Breakdown

*This schedule serves as a guideline. It may be changed at the instructor’s discretion.

Week	Topics/Daily Activities	Readings	Assignments	Deliverables
1	Introduction to smart mobility	NA	NA	NA
2	Urban Air Mobility (UAM): flying taxis and drone-based transportation	Reading 1	HW1 assigned	
3	Adapting the Rail Industry for Tomorrow's Challenges	Reading 1 Reading 2		HW1 due
4	Mobility as a Service (MaaS): integrated platforms for seamless multimodal transportation solutions	Reading 1 Reading 2	HW2 assigned	
5	Electrification: implementing charging infrastructure for electric vehicles to support mass adoption	Reading 1 Reading 2	HW3 assigned Term Paper Task1 assigned	HW2 due
6	Sustainable Transportation Materials: eco-friendly materials for vehicles and infrastructure to reduce environmental impact	Reading 1 Reading 2		HW3 due
7	Mid-term Exam	NA		
8	Transportation Energy Efficiency: Investigating strategies to improve energy efficiency in various modes of transportation	Reading 1 Reading 2	HW4 assigned	Term Paper Task 1 due

9	Equity in Transportation	Reading 1 Reading 2	Term Paper Task2 assigned	HW4 due
10	Hyperloop and High-Speed Rail: high-speed rail systems for efficient long-distance travel	Reading 1 Reading 2		Term Paper Task2 due
11	Ridehailing and Micro-Transit: shaping Urban Transportation	Reading 1	HW5 assigned	
12	Micromobility and carsharing: Changing the Way We Move	Reading 1	Term Paper Task3 assigned	HW5 due
13	Telework: Remote Work and Its Impact on Mobility	Reading 1 Reading 2		
14	Smart Fleet			Term Paper Task3 due
15	Paper Presentations	NA		Presentation due
FINAL	Final Paper	Final paper is due on the exam day assigned to the course. Refer to the final exam schedule in the USC Schedule of Classes at www.usc.edu/soc .		

Statement on Academic Conduct and Support Systems

Academic Integrity:

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

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

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

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.