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UNIVERSITY OF CONNECTICUT  
CE 4720 / 5720: STREET AND HIGHWAY DESIGN  
SPRING 2023 COURSE SYLLABUS

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**CLASSROOM:** ROWE 122      **CLASS TIME:** Mon Wed 5:45pm-7:00pm

**INSTRUCTOR:** Ge Shi  
Email: [ge.shi@uconn.edu](mailto:ge.shi@uconn.edu)  
Office Hours: Wednesday 4:30 PM – 5:30 PM or by appointment; at BRON 201

**COURSE DESCRIPTION:**

Prerequisite: CE 2710. Recommended preparation: CE 4410. History of street and highway design; land-use context, street design data collection and analysis, speed, safety and street network characterization; pedestrian and bikers in design, cross-section and alignment design.

**COURSE FOUNDATION:**

Over the last decade attitudes towards the design of streets in the US have undergone a dramatic shift. Places all over the country have radically revised their approach, focusing less on vehicle movement and more on the economic and social functioning of their streets. Attempts to develop more inclusive design come in many guises, under such names as traffic calming, complete streets, road diets, and shared space.

In this class we will look at the theory underlying these state-of-the-art practices and develop a holistic approach for design streets that are safer, more efficient and that support community vibrancy and vitality.

In addition to looking at the design of individual streets we will also focus on the art and science of designing street networks. American designers have a proud history of designing street networks that created the template for the building of great cities. But these days the skills needed to design street networks are no longer part of the typical repertoire of engineers and planners in America. Fortunately, with the advent of the New Urbanist movement and its interest in building complete communities, the importance of street networks is once again being recognized.

One goal of in this class is to help resurrect this American tradition of excellent in street network design and to pair it with the tools and knowledge needed to design beautiful and safe streets.

**COURSE OBJECTIVES:**

1. Learn and understand the impact of street design on society
2. Learn about the impact of design on speed and the importance of speed to safety and the function of streets
3. Learn and understand the different types of thoroughfares and the importance of the classification system
4. Learn how streets are designed to accommodate various types of users including pedestrians and bicyclists
5. Learn the foundation of street network design
6. Learn to apply the elements of street design through a semester long design project

**WEBSITE:**

- HuskyCT – [huskyct.uconn.edu](https://huskyct.uconn.edu)

**RECOMMENDED TEXTBOOKS:**

- Institute of Transportation Engineers. Traffic Engineering Handbook, 7th Edition, WILEY, 2016.

Note: This text is certainly not required for this course. Any references to material from this text will be scanned and included on HuskyCT or included in course lectures.

**HOMEWORK:**

There will be a total of 9 homework assignments throughout the course. Only 8 homework assignments with highest scores will be counted (so you have the option to pass or miss one). Homework will be assigned at the end of class on Wednesday and will be due at 5:45 PM the following Wednesday unless otherwise noted. **No late homework will be accepted** unless otherwise noted by the instructor. Homework assignments will be posted on HuskyCT. Homework must be submitted online through HuskyCT. Illegible homework will be considered incomplete.

**DESIGN PROJECT:**

There will be one design project which shall be completed in project teams. The final report for the group should be no more than 12 typewritten pages (double spaced and inclusive of figures and tables). Reports shall clearly note the person or persons responsible for each section, table or figure, or overall writing of the project report.

**TERM PAPER (CE 5720 Only):**

Students enrolled in CE 5720 will be required to write a term paper of no more than 12 typewritten pages (double space and inclusive of figures and tables) in a subject of their own choosing related to street design.

**MID-TERM EXAM:** There will be one mid-term examination that takes place during class.

**FINAL EXAM:** The Final Exam is comprehensive with the date scheduled for exam week beginning May 1, 2023. The date and location will be announced at a later date.

**GRADING:** \*\* If you do better on the Finals than on the mid-term then the weights above will be changed to the following: CE 4720 - Mid-term 17.5%, Finals 52.5%, CE 5720 - Mid-term 12.5%, Finals 37.5%

	CE 4720	CE 5720
HW	10%	10%
Design Project	20%	15%
Term Paper	N/A	25%
Mid-Term Exam	35%	25%
Final Exam	35%	25%
Total	100%	100%

**CE 4720 / 5720 Spring 2023 Lecture Schedule**

WEEK	CLASS	DATE	TOPICS	DUE
1	1	Wednesday, Jan 18	Introductions	
2	2	Monday, Jan 23	Evolution of Street Design in America	
	3	Wednesday, Jan 25	Character of a Street	
3	4	Monday, Jan 30	Context versus System Time in Design	HW 1
	5	Wednesday, Feb 01	Target Speed and Design Speed	
4	6	Monday, Feb 06	Classifications of Streets and Highways	HW 2
	7	Wednesday, Feb 08	Basics of Street Networks	
5	8	Monday, Feb 13	Design of Street Networks	
	9	Wednesday, Feb 15	Data for Transportation Design	HW 3
6	10	Monday, Feb 20	Design Controls in Transport Design	HW 4
	11	Wednesday, Feb 22	Performance Measures	
7	12	Monday, Feb 27	Midterm Review	HW 5
	13	Wednesday, Mar 01	Midterm	
8	14	Monday, Mar 06	Guest Lecture: Quinn Molly	Project Groups
	15	Wednesday, Mar 08	Guest Lecture (ctrash.uconn.edu): Dr. Eric Jackson	
		Monday, Mar 13	Spring Recess	
		Wednesday, Mar 15	Spring Recess	
9	16	Monday, Mar 20	Elements of Urban Street Design	
	17	Wednesday, Mar 22	Course Project Intro: Fred Song and Niloufar Shirani	Project Assign.
10	18	Monday, Mar 27	Fundamentals to Intersection Design	HW 6
	19	Wednesday, Mar 29	Fundamentals to Intersection Design cont. Signals	
11	20	Monday, Apr 03	Geometric Design: Vertical Alignment	HW 7
	21	Wednesday, Apr 05	Horizontal Alignment Coordination	
12	22	Monday, Apr 10	Bike Facilities and Bike Network Design	HW 8
	23	Wednesday, Apr 12	Roundabouts	
13	24	Monday, Apr 17	Design Project Studio: GIS with Quinn Molly	HW 9
	25	Wednesday, Apr 19	Design Project Studio: Fred Song	
14	26	Monday, Apr 24	Term Project Presentations	Project Report
	27	Wednesday, Apr 26	Term Project Presentations cont.	Term Paper
May 1, 6:00-8:00pm, ROWE 122			<b>FINAL EXAM</b>	

**UConn Final Exam Policy:** Final exam week for Spring 2023 takes place from May 01st through May 06th. Students are required to be available for their exam during the stated time. If you have a conflict with this time, you must visit the Office of Student Services and Advocacy to discuss the possibility of rescheduling this exam. Please note that vacations, previously purchased tickets or reservations, graduations, social events, misreading the exam schedule and over-sleeping are not viable excuses for missing a final exam. If you think that your situation warrants permission to reschedule, please contact the Office of Student Services and Advocacy with any questions. Complete information can be found at this link: <https://dos.uconn.edu/finals-rescheduling/>