THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

URBAN TRANSPORTATION PLANNING

Plan 636-001 Spring 2024
The University of North Carolina at Chapel Hill

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COURSE INFORMATION

Credit Hours: 3

Pre or Co-Requisites: Unclear

Target Audience: DCRP graduate students and advanced undergraduates

Meeting Pattern: Mondays and Wednesdays 11:15 – 12:30 PM

Instructional Format: in-person

Classroom or Location: New West Room 219

Instructor Information

Name: Matthew Palm

Email Address: palmmatt@unc.edu

Office Location: 202 New East Building

Office Hours: 1:15 – 2:15 Mondays, online or in person.

Zoom Room ID:

https://unc.zoom.us/j/96348769327

Teaching Assistant Information

Name: Yuhua Wang

Email Address: yuhuaw@ad.unc.edu

Office Location: TA Office (405) New East Building

Office Hours: By appointment

Course Content

Course Description

This course prepares students to be effective practitioners and informed citizens at a time when rapid advances in technology are quickly changing the transport field. We will focus on three aspects of urban transportation planning:

Understanding the Transport System: How does transportation work? How do people and goods travel? What are new mobility options, and how might they reshape transportation planning?
Challenges: What are the key issues in the transport field? This section focuses on understanding current travel patterns (and their links to demographics and land use), as well as identifying key challenges and opportunities for the transport field (congestion, freight, air quality, shared mobility, and autonomous vehicles).
Planning: This section provides a broad introduction to the institutional structure and technical tools of transportation planning in the US. We look at the federal, state, and local levels. This section will also introduce you to the common analysis techniques used in transportation and consider their effectiveness. This section provides a strong skill basis for any students interested in pursuing careers in transportation consulting firms or municipalities (or anyone who plans to be involved with the development process).

I RESERVE THE RIGHT TO CHANGE THE SYLLABUS DURING THE TERM.

Course Texts & Materials

Everything you need is on canvas.

Class Expectations

What you get out of this class is directly proportional to the effort you put in it. Practicing the following will empower you to get the most out of this course:

- Complete all readings prior to class and come prepared to discuss. **This is most important.**

- Study for the exams.
- Be respectful and supportive as a partner on group projects.

Course Goals & Student Learning Outcomes (SLOs)

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

- Describe the purposes of the transportation system and how systems are evaluated for effectiveness.
- Identify, interpret, and apply relevant transportation planning standards and guidelines.
- Evaluate and synthesize transportation statistics and data.
- Present complex and often contradictory transportation data in a clear, concise and rigorous manner.
- Collect transportation data.

Course Assignments & Assessments

This course has two 'tracks' for learning: one for self-directed study and another for applied group work. Students in both tracks will still need to complete the midterm and final exams. But all other assignment Each are described below:

- **SELF-DIRECTED TRACK**: All your work in the class will build towards a research paper on a topic of interest to you. This paper will be in Transportation Research Board (TRB) format, which I will help you with. It can be a review of existing knowledge, interviews of practitioners and community groups, or original quantitative analysis (I can help you find data). I also have ongoing projects I can give you data from to work on. Ideally, your project will be strong enough so you can submit it to TRB if you want. In that case, you may need to go through IRB. TRB is the largest annual conference on transportation in the world, with tens of thousands of attendees.
- **APPLIED GROUP TRACK:** This track gives you the opportunity to work in groups to apply course concepts to real world locations and policy topics. The group projects in this class are based on similar assignments used at comparable institutions such as MIT and UC Berkeley. You will have the opportunity to test yourself and your knowledge of planning, taking your skills to the next level.

Assignments for Everyone

Assignment 1: Midterm 20%

This is an in-person timed exam covering lecture content and readings. The goal behind this assessment is to help you commit concepts to memory and be able to explain transportation concepts in your own words on the fly. The test will consist of short answers, multiple choice, true/false, and other questions.

Assignment 3: Attendance and participation 10%

The TA and I will have clipboards in class marking down who attends and who speaks. For each week, you get a point if you:

- attend both classes.
- speak once in class, either during breakout discussions, pair shares, or with the whole class.
- Don't hog the mic. If you are trying to be the first to answer every question all the time it doesn't give space for others. Just be mindful.

It's 10 points because you need to meet these requirements for only 10 of the 15 weeks.

Self-directed Track

Research Paper—70%

- **Research proposal 10%:** An extended abstract outlining your proposed research topic. This document will introduce your topic and methods. Some of this language will be part of the abstract and introduction of your final TRB paper. 600 to 800 words. **Due Jan 29th at start of class**. You can email it or hand it in physically.
- **Lit review and methods sections 12.5%:** This will build on your proposal, justifying your paper's contribution to the literature and outlining your methods. 1,200 to 1,400 words, some of which can be recycled from the proposal. **Due Feb 21st at start of class**. You can email it or hand it in physically.
- **Results and conclusions 12.5%:** You will provide preliminary results and conclusions of your analysis. 1,400 to 1,600 words. This should exclude prior assignments as these are separate sections (each figure is 250 words, each table is 250 words). **Due Mar 27th at start of class**. You can email it or hand it in physically.
- **Draft final paper 15%:** you will combine your introduction (proposal), lit review and methods with your results and conclusions to submit a draft final paper to me. You will likely be adding between 1,000 to 1,500 words to your paper (recall each added figure is 250 words, each table is 250 words). **Due Apr 11th at start of class**. You can email it or hand it in physically.
- **Final paper 20%:** You will revise your draft final paper based on my feedback. The intent of this process is to mimic peer-review. You will likely be re-writing between 800 and 1,000 words but possibly much more if your draft needed significant change. **Due May 2nd at 4pm**. Email it to me directly.

Applied Group Track

Intersection Analysis—25%

Your team will evaluate an intersection of your choice in the triangle area. You will write a group report between 12 and 14 single-spaded pages in which you will:

- Describe the intersection's context, function, and history
- Explain how transportation has influenced the development of surrounding land uses, and how those uses now influence the intersection's performance.
- Identify the key stakeholders affected by the performance of this intersection.
- Document major travel patterns and behavior at the intersection (you will do counts and observational research on-site)
- Identify problems or issues with the intersection
- Propose solutions to any identified problems

Due Friday March 29th at 11:59PM emailed to me directly.

MPO Analysis—25%

According to the transportation bill, metropolitan planning organizations (MPOs), States, and public transportation operators should have procedures to advance projects from the first four years of an approved transportation improvement program (TIP) and/or State-TIP to implementation [23 CFR 450.104]. In identifying which projects will be implemented, there are some procedural requirements such as guaranteeing certain levels of public information and participation. Other procedural aspects are not prescribed. This assignment requires that each group identify a single MPO and review its procedures for advancing projects to implementation. Your group will write an 8-10 page single spaced paper (approx. 4,000 – 5,000 words) and prepare a 15 minute presentation evaluating your MPO's project prioritization and selection process. Please be as rigorous as possible in describing the project selection process, as I will offer your assignment to the MPO you are evaluating.

Due Friday March 29th at 11:59PM emailed to me directly.

Assignment 2: Final 20%

This is an in-person timed exam covering lecture content and readings. The goal behind this assessment is to help you commit concepts to memory and be able to explain transportation planning concepts in your own words on the fly. The test will consist of short answers, multiple choice, true/false, and other questions. It is cumulative, but only a third of the questions will pertain to materials covered before the midterm.

Grading Scale & Schema

Late Work

If it looks like you are unable to complete an assignment on time, talk to me and we can try to work something out. However, if you do not reach out to me in advance, the following late work penalties apply:

Days Late	Deduction
24 hrs	-10%
48 hrs	-12%
72 hrs	-15%
5 days	-20%
7 days	-25%
Over 14 days	Fail (50%)

Grading Rubrics

Will be distributed in class.

Undergraduate Grading Scale

Numeric Grade (%)	Letter Grade
93.5 and above	A
89.5 – 93.4	A-
86.5 – 89.4	B+
82.5 – 86.4	B
79.5 – 82.4	B-
76.5 – 79.4	C+
72.5 – 76.4	C
69.5 – 72.4	C-
66.5 – 69.4	D+
59.5 – 66.4	D
59.4 and below	F

Table a: Grading Scale Table

Graduate Grading Scale

Graduate student work will receive numeric grades just like undergraduates. These grades will translate as follows:

- High Pass: top 5-10% of students based on numeric grades, plus others who did exceptional work
- Pass: 74.95% and up
- Low Pass: 59.45% to 74.94%
- Fail: 59.44% and below

To maintain a pass, a graduate student must maintain a numeric grade at or above 74.95%.

COURSE SCHEDULE

The building blocks of the system

Class (Date/Week)	Topic(s)	Readings & Assignments Due
Jan 10	Transportation Research Board Week (No Class)	
Jan 15	**MLK Day, No class**	
Jan 17	What is the purpose of transportation planning?	Marhon p. ix-15, Handy p. 9-25 Optional: Shill and Levine 2023
Jan 22	Hierarchical network thinking: Streets, roads, stroads, oh my	Marhon p. 16-44; Handy p. 138-158; and skim only **NCDOT** 2005**.** Urban Street Design Guidelines p. 3-7
Jan 24	Level of Service and the Highway Capacity Manual	Handy p. 72-89; **HCM** snippet; **NCDOT** 2011 p. 1-5, have fun skimming the rest.
Jan 29	MUTCD and changing the road	Marhon p. 45-63; Handy p. 187-204; The MUTCD Part 4--Sections 4A.01-4A.03 *skim* Sections 4C.01- Section 4C.10. Bring your laptop to class. We will be going through these comments: https://www.regulations.gov/docket/FHWA-2020-0001/comments. **Self-directed track: Proposal due in class**
Jan 31	Street Design: A Brief Intro	Urban Street Design Guidelines p. 7-30 and p. 135-158 (don't worry it's mostly pictures!) Mahron p. 65-81
Feb 5	Pedestrian Infrastructure 101	Urban Street Design Guidelines p. 33-44 and p. 109-116; Handy 159-186
Feb 7	Cycling 101	Urban Bikeway Design Guidelines p. 1-46
Feb 12	**Well-being day** **Be Well!**	
Feb 14	**In class test**	**In class test wk6**

Table b: Unit/Module 1 Schedule

Capacity issues; Oh and transit

Class (Date/Week)	Topic(s)	Readings & Assignments Due
Feb 19	Solving capacity: Expand or better manage what we have	Intersection study announced; Handy p. 117-135; FHWA Operations Handbook All of 8.1-8.5 stop before "Design considerations" Optional Ralph et al. 2022 because it's about you!
Feb 21	Solving capacity: shared mobility and automation to the rescue	Readings TBA **Self-directed track: Lit review/methods due in class**
Feb 26	Solving capacity: or just embrace congestion	Mahron 83-99; Khalaj et al 2020; McCormick 2020
Feb 28	Car Ownership	Klein et al. 2020; Klein 2020
Mar 4	Public Transit 101	Walker chp, 1-3, Walker chp, 7
Mar 6	Making buses work: more like cars vs more like rail	Readings TBA pending guest speaker
Mar 11	**Spring Break**	
Mar 13	**Spring Break**	

Table c: Unit/Module 2 Schedule

Behavior, models and forecasting

Class (Date/Week)	Topic(s)	Readings & Assignments Due
Mar 18	Travel Behavior 101	None
Mar 20	Travel Behavior 102 Role of Land Use	Stevens 2017 **Applied track: Intersection study due Friday the 22nd at 11:59PM**
Mar 25	Transportation Data Sources	Introduce MPO assignment
Mar 27	From Behavior to Modelling: Traffic Impact Assessment	Volker et al. 2020; Millard-Ball 2015; Schneider et al 2014 **Self-directed track: Results/conclusions due**
Apr 1	From Behavior to Modelling: Demand Forecasting	Metz 2008; Beimborn and Kennedy 2006
Apr 3	The MPO system and outcomes	Sciara 2017; Karner & Niemeier 2015; Davis p. 37-54

Table d: Unit/Module 3 Schedule

Equity and Engagement

Class (Date/Week)	Topic(s)	Readings & Assignments Due
Apr 8	(In)Justices in Transportation	Davis p. 1-36
Apr 10	Race, Infrastructure, and Inequality	Barajas 2021, Davis p. 77-97 **Self-directed track: draft final paper due**
Apr 15	Procedural justice	Davis p. 97-120
Apr 17	Local environmental impacts	**Rodrigue 2023**
Apr 22	Planning for evacuations	
Apr 24	MPO Presentations	
Apr 29	MPO Presentations	
	Applied track: Final at 4pm **Self-directed track: Final draft due**	

Table e: Unit/Module 4 Schedule

POLICY STATEMENTS

Academic Policies

University Class Attendance Policy (required)

University Policy: As stated in the University's Class Attendance Policy, no right or privilege exists that permits a student to be absent from any class meetings, except for these University Approved Absences:

1. Authorized University activities: University Approved Absence Office (UAAO) website provides information and FAQs for students and FAQs for faculty related to University Approved Absences
2. Disability/religious observance/pregnancy, as required by law and approved by Accessibility Resources and Service and/or the Equal Opportunity and Compliance Office (EOC)
3. Significant health condition and/or personal/family emergency as approved by the Office of the Dean of Students, Gender Violence Service Coordinators, and/or the Equal Opportunity and Compliance Office (EOC).

Instructors may work with students to meet attendance needs that do not fall within University approved absences. For situations when an absence is not University approved (e.g., a job interview, illness/ flu or club activity), instructors are encouraged to work directly with students to determine the best approach to missed classes and make-up assessment and assignments.

Honor Code Statement (required)

All students are expected to follow the guidelines of the UNC Honor Code. In particular, students are expected to refrain from "lying, cheating, or stealing" in the academic context. If you are unsure about which actions violate the Honor Code, please see me, or consult studentconduct.unc.edu.

Syllabus Changes (required)

The instructor reserves the right to make changes to the syllabus including project due dates and test dates. These changes will be announced as early as possible.

Acceptable Use Policy

By attending the University of North Carolina at Chapel Hill, you agree to abide by the University of North Carolina at Chapel Hill policies related to the acceptable use of IT systems and services. The Acceptable Use Policy (AUP) sets the expectation that you will use the University's technology resources responsibly, consistent with the University's mission. In the context of a class, it's quite likely you will participate in online activities that could include personal information

about you or your peers, and the AUP addresses your obligations to protect the privacy of class participants. In addition, the AUP addresses matters of others' intellectual property, including copyright. These are only a couple of typical examples, so you should consult the full Information Technology Acceptable Use Policy, which covers topics related to using digital resources, such as privacy, confidentiality, and intellectual property. Additionally, consult the Safe Computing at UNC website for information about data security policies, updates, and tips on keeping your identity, information, and devices safe.

Data Security & Privacy

UNC-Chapel Hill Privacy Statement: Sakai's Discussion Forum, Assignments, DropBox, Gradebook, and Tests & Quizzes tools are designed to share FERPA-protected information privately between instructors and individual students.

Grade Appeal Process

If you have any concerns with grading and/or feel you have been awarded an incorrect grade, please discuss it with me as soon as possible. If we cannot resolve the issue, you may talk to our director of undergraduate studies or department chair.

Services & Student Support Policies

Accessibility Resources & Services (ARS) (required)

Accessibility Resources and Service (ARS – ars@unc.edu) receives requests for accommodations, and through the Student and Applicant Accommodations Policy determines eligibility and identifies reasonable accommodations for students with disabilities and/or chronic medical conditions to mitigate or remove the barriers experienced in accessing University courses, programs and activities. ARS also offers its Testing Center resources to students and instructors to facilitate the implementation of testing accommodations. Faculty and instructors with any concerns or questions about accommodations and/or their implementation, are invited to reach out to ARS to discuss.

Counseling & Psychological Services (CAPS) (required)

UNC-Chapel Hill is strongly committed to addressing the mental health needs of a diverse student body. The Heels Care Network website is a place to access the many mental health resources at Carolina. CAPS is the primary mental health provider for students, offering timely access to consultation and connection to clinically appropriate services. Go to their website https://caps.unc.edu/ or visit their facilities on the third floor of the Campus Health building for an initial evaluation to learn more. Students can also call CAPS 24/7 at 919-966-3658 for immediate assistance.

Title IX Resources (required)

Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC at https://eoc.unc.edu/report-an-incident/ or by contacting the University's Title IX Coordinator (Elizabeth Hall, titleixcoordinator@unc.edu) or the Report and Response Coordinators in the Equal Opportunity and Compliance Office (reportandresponse@unc.edu). Confidential resources include Counseling and Psychological Services and the Gender Violence Services Coordinators (gvsc@unc.edu). Additional resources are available at safe.unc.edu.

Policy on Non-Discrimination

The University is committed to providing an inclusive and welcoming environment for all members of our community and to ensuring that educational and employment decisions are based on individuals' abilities and qualifications. Consistent with this principle and applicable laws, the University's Policy Statement on Non-Discrimination offers access to its educational programs and activities as well as employment terms and conditions without respect to race, color, gender, national origin, age, religion, genetic information, disability, veteran's status, sexual orientation, gender identity or gender expression. Such a policy ensures that only relevant factors are considered, and that equitable and consistent standards of conduct and performance are applied. If you are experiencing harassment or discrimination, you can seek assistance and file a report through the Report and Response Coordinators (email reportandresponse@unc.edu or see additional contact info at safe.unc.edu) or the Equal Opportunity and Compliance Office at https://eoc.unc.edu/report-an-incident/.

Diversity Statement

I value the perspectives of individuals from all backgrounds reflecting the diversity of our students. I broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. I strive to make this classroom an inclusive space for all students. Please let me know if there is anything I can do to improve. I appreciate any suggestions.

Undergraduate Testing Center

The College of Arts and Sciences provides a secure, proctored environment in which exams can be taken. The center works with instructors to proctor exams for their undergraduate students who are not registered with ARS and who do not need testing accommodations as provided by ARS. In other words, the Center provides a proctored testing environment for students who are unable to take an exam at the normally scheduled time (with pre-arrangement by your instructor). For more information, visit http://testingcenter.web.unc.edu/.

Learning Center

Want to get the most out of this course or others this semester? Visit UNC's Learning Center at http://learningcenter.unc.edu to make an appointment or register for an event. Their free, popular programs will help you optimize your academic performance. Try academic coaching, peer tutoring, STEM support, ADHD/LD services, workshops and study camps, or review tips and tools available on the website.

Writing Center

For free feedback on any course writing projects, check out UNC's Writing Center. Writing Center coaches can assist with any writing project, including multimedia projects and application essays, at any stage of the writing process. You don't even need a draft to come visit. To schedule a 45-minute appointment, review quick tips, or request written feedback online, visit http://writingcenter.unc.edu.