

CEE 4610
Multimodal Transport
Fall 2016

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Official Description: Planning, design and operation of systems of air, rail, water and highway facilities, including those for bicycles and pedestrians.

In this course, we will focus on the need, purpose and design for multimodality. Why is a multimodal transportation system important? How do we plan and design for multimodal transportation? How do we measure the performance of a multimodal transportation system? What is a complete street and what guides are available for complete streets design? Why is it more efficient for freight to be moved via various modes and how do these modes interact?



This course is part of Georgia Tech's Serve-Learn-Sustain (SLS) initiative, which provides students with opportunities to combine their academic and career interests with their desire to make worthwhile contributions to the world and build

sustainable communities where people and nature thrive, in Georgia, the United States, and around the globe. More information about SLS can be found at www.serve-learn-sustain.gatech.edu. Visit the website to sign up for the [SLS Email List](#), view the full list of [affiliated courses and projects](#), and find links to Facebook, Instagram and Twitter.

Assessment: Grading will take place as follows:

- 10% Discussion Participation – students are encouraged to be active participants in course discussion by completing readings in advance of the course period. We will monitor participation and play games to encourage it.
- 20% Quizzes and Extended Assignments – Two short closed-note in-class quizzes and two extended take-home assignments will be given to assess understanding of the material presented in class *and in the reading*.
- 20% Homework – Approximately six assignments will be assigned throughout the semester to allow students to both evaluate key topics in greater depth and to work with datasets to develop quantitative analysis skills. Each assignment will be due one week after being assigned. If for any reason you expect to turn in an assignment late, you must receive advance permission from the instructor or it will not be credited. Collaboration is encouraged to develop a deeper understanding of the material; however, the final results and conclusions on all assignments must be your own work. All collaboration must be noted at the top of the assignment.
- 50% Projects – Students will conduct two projects throughout the semester in small groups. The first project will focus on multimodal passenger transportation and the second will focus on multimodal freight transportation.

Academic Honesty: Plagiarizing is defined by Webster's as "to steal and pass off (the ideas or words of another) as one's own: use (another's production) without crediting the source." If caught plagiarizing, you will be dealt with according to the GT Academic Honor Code. For any questions involving these or any other Academic Honor Code issues, please consult the instructor or www.honor.gatech.edu.

References: There is currently no official textbook for this course. Instead, readings will be pulled from the literature, including national references such as those produced by the American Association of State Highway and Transportation Officials (AASHTO) and the National Association of City Transportation Officials (NACTO). In addition, the instructors are in the process of writing a textbook.

Serve-Learn-Sustain (SLS): This course is part of Georgia Tech's SLS initiative, which provides students with opportunities inside and outside the classroom designed to help them combine their academic and career interests with their desire to improve the human condition, allowing them to help build healthier, more sustainable communities where people and nature thrive. More information about SLS can be found at www.serve-learn-sustain.gatech.edu, including a listserv and social media links.

Introduction with Dr. Rodgers and Watkins

Dates	Topics	Readings / Assignments
Aug 23	Introduction	
Aug 25	Fundamentals of Transportation	Read TRB Critical Issues from 2009 and 2013: http://onlinepubs.trb.org/Onlinepubs/general/criticalissues09.pdf http://onlinepubs.trb.org/Onlinepubs/general/criticalissues13.pdf

Part 1 with Dr. Watkins

Aug 30	Human Mobility and Transportation Impacts	
Sept 1	Defining Complete Streets	Complete Streets Coalition, "Elements of a Complete Streets Policy", http://www.smartgrowthamerica.org/documents/cs/policy/cs-policyelements.pdf <i>Assignment 1 – GDOT Policy assessment</i>
Sept 6	Design for Pedestrians	AASHTO (2004), "Guide for the Planning, Design, and Operation of Pedestrian Facilities", selected reading
Sept 8	Design for Bicycles	NACTO (2012), "Urban Bikeway Design Guide", http://nacto.org/publication/urban-bikeway-design-guide/ FHWA (2015), "Separated Bike Lane Planning and Design Guide", http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/separated_bikelane_pdg/separatedbikelane_pdg.pdf
Sept 13	Americans with Disabilities Act (Wheelchair lab) – Senior design conflict	<i>Assignment 2 – Wheelchair accessibility assessment</i>
Sept 15	Quiz #1 / time for project	
Sept 20	Design for Transit	AASHTO (2014), "Guide for Geometric Design of Transit Facilities on Hwys & Streets" <i>Assignment 3 – Modal accessibility scores</i>
Sept 22	Traffic Calming and Roundabouts	http://trafficalming.org/ and http://safety.fhwa.dot.gov/intersection/roundabouts/
Sept 27	Urban Street Design	NACTO (2013), "Urban Street Design Guide", http://nacto.org/usdg/
Sept 29	Multimodal Performance Measurement	(2008), "NCHRP Report 616 - Multimodal Level of Service Analysis for Urban Streets", http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_616.pdf <i>Assignment 4 – Level of service calculation</i>
Oct 4	Multimodal Safety Impacts	
Oct 6	Quiz #2 / time for project	
Oct 11	<i>No School – Mid-Fall Break</i>	
Oct 18	<i>Project 1 Poster presentations</i>	

Part 2 with Dr. Rodgers

Oct 13	World Trade	Supplementary materials to be provided
Oct 20	Trucking and Drayage	Lecture Notes <i>Assignment 5 – Truck routing problem</i>
Oct 25	Rail Transport (Overview)	Lecture Notes <i>Extended Assignment 1 – Track design</i>
Oct 27	Railway Track and Infrastructure	Supplementary materials to be provided
Nov 1	Rolling Stock	Supplementary materials to be provided
Nov 3	Railway Operations and Maintenance	Supplementary materials to be provided
Nov 8	Water Transport (Ports and Waterways)	Lecture Notes <i>Assignment 6 – Port logistics</i>
Nov 10	Maritime Transport	Supplementary materials to be provided
Nov 15	Inland Marine	Supplementary materials to be provided
Nov 17	Pipeline	Lecture Notes <i>Extended Assignment 2 – Multimodal Operations</i>
Nov 22	Air Freight Operations	Supplementary materials to be provided
Nov 24	<i>No School – Thanksgiving Break</i>	
Nov 24	Small Package Delivery and Logistics	Supplementary materials to be provided
Nov 29	Multimodality and Intermodal Transfer	Lecture Notes
Dec 1 & 6	<i>Time for projects</i>	
Final Exam	<i>Project 2 Poster presentations</i>	