Fall 2012

Department of Civil and Environmental Engineering

University of Massachusetts

CEE 610 Transportation Analysis and Planning

Elab 327, TuTh 11:15-12:30

Instructor: **Song Gao**

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Catalog Description*:*

> Advanced topics in transportation planning and analysis, including a review of linear regression, discrete choice model theory, estimation and applications, and traffic assignment model theory and applications with a computer programming component. Topics covered vary across semesters. Supplemented by scholarly publications that reflect the current research development in travel behavior modeling, transportation demand forecasting, traffic network modeling and optimization.

Pre-requisites: CEE 509 **Credit Hours**: 3

Course Website: https://moodle.umass.edu/course/view.php?id=1905

Required Textbook(s):

S Sheffi, Yosef. *Urban Transportation Networks: Equilibrium Analysis with Mathematical Programming Methods*, Prentice-Hall, 1985, ISBN-13: 978-0139397295. (Available for download at http://web.mit.edu/sheffi/www/selectedMedia/sheffi_urban_trans_networks.pdf)

B Ben-Akiva, Moshe and Lerman, Steven L. *Discrete Choice Analysis: Theory and Applications to Travel Demand*, MIT Press, 1985. ISBN-13: 978-0262022170 ($56.30 on Amazon.com)

Attendance policy: All students are expected to attend all classes and to be at class on time. Poor attendance will negatively affect your grade.

Academic honesty policy: The UMass Academic Honesty Policy applies and can be found at http://www.umass.edu/dean_students/codeofconduct/acadhonesty/. The policy covers plagiarism, cheating, fabrication, and facilitating dishonesty.

Assessment Methods (grading and instructor feedback):

Assignments:	40% (Assignments have non-equal lengths and thus weights)
Quizzes:	40% (in-class, open book/open notes)
Research Paper and Presentation:	20%

Research Paper

A research paper will be used for the assessment of the second block (the psychology of travel decision making), in lieu of a quiz. Both written and oral presentations are required.

Class Schedule

No.	Date		Topic	Reading	Assignment		Research Paper
					Out	In	
Discrete Choice Analysis							
1	Sep	4	Review of Discrete Choice Analysis	B4	1		
2		6	Multinomial Logit Model (1)	B5			
3		11	Multinomial Logit Model (2)	B5			
4		13	Aggregation and Forecasting	B6			
5		18	Tests of Model Specifications (1)	B7	2		
6		20	Tests of Model Specifications (2)	B7		1	
7		25	Nested Logit (1)	B10			
8		27	Nested Logit (2)	B10			
The Psychology of Travel Decision Making							
9	Oct	2	Expected Utility (EU) Theory (1)	Handout			Assigned
10		4	EU Theory (2)	Handout		2	
		9	**No Class (Monday Schedule)**				
11		11	Prospect Theory	Handout	3		
12		16	**No Class (INFORMS)**				
13		18	**Quiz 1**			3	
14		23	Cumulative Prospect Theory	Handout	4		
15		25	Procedural Models	Handout			Prospectus Due
16		30	Decision from Experience	Handout		4	
Network Equilibrium Analysis							
17	Nov	1	Overview of Optimization	S2	5		
18		6	Formulation and Properties of UE	S3			
19		8	**Research Paper Presentations**				Paper Due
20		13	Formulation and Properties of SO	S3			
21		15	Solving UE and AON	S5.2,5.3			
22		20	Stochastic Loading	S11	6		
		22	**No Class (Thanksgiving)**				
23		27	Stochastic User Equilibrium	S12		5	
24		29	Dynamic Traffic Assignment	Handout			
25	Dec	4	Advanced Congestion Pricing	Handout			
26		6	**Quiz 2**			6	

Prepared by: Song Gao

Date: 10/10/2012