

TRSS 416/TRSP 616: Microcomputer Applications in Transportation

Spring 2015, Th 5:00 PM – 7:45 PM, CBEIS 251

Instructor	Dr. Celeste Chavis	Office Hours	Monday: 3:00 PM – 5:00 PM
Office	CBEIS – Room 241		Tuesday: 1:30 AM – 3:30 PM
Phone	443-885-5061		Wednesday: 1:30 PM – 3:30 PM
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Course Description

This course will cover four software packages that are commonly used in the different transportation professional areas, including Microsoft Excel and Matlab for transportation data analysis, the Highway Capacity Software (HCS) and Synchro for traffic engineering and simulation.

Prerequisites: TRSS 414, 415.

Course Objectives

This course is designed to provide students with an introduction of microcomputer applications appropriate for solving problems in transportation planning, systems analysis, and simulation. This course will incorporate hands-on activities and real world case studies. By the end of the semester students will be able to: Perform statistical test, correlation analysis, regression analysis and interpret the results; Build and analyze a traffic network model in simulation tools; Conduct simulation techniques to analyze intersections and corridors.

Learning Outcomes

Students should demonstrate ability to:

- Outcome b – Design and conduct experiment, as well as to analyze and interpret data
- Outcome c – Formulate or design a system, process, or program to meet desired needs
- Outcome g – Communicate effectively
- Outcome j – Develop knowledge of contemporary issues
- Outcome k – Use the techniques, skills, and modern scientific and technical tools necessary for professional practice

Teaching Method

The course will be a project-based course and involves mainly computer applications, along with some lectures of the relevant subject matter.

Course Requirements and Student Evaluation

In order to successfully complete the course, students are required to regularly participate in class discussions, complete and submit all assignments on time, and perform satisfactorily on given

projects. Assignments are due at the beginning of class.; **unexcused late assignments will receive a 25% deduction for each day late.** All projects / papers should be well written and presented professionally.

TRSS 420

- Assignments 40%
- Projects 50%
- Class participation/Attendance 10%

TRSP 620

- Assignments 50%
- Projects 50%

The grade distribution is as follows:

- A 90 – 100%
- B 75 – 89%
- C 65 – 74%
- F Below 65%

Academic Honesty

Students **currently** taking this class can work together to conceptualize general approaches to assignments. However, unless otherwise specified for a particular assignment, the work you submit should be done completely on your own. This includes text, numerical calculations, mathematical derivations, diagrams, graphs, computer programs and outputs.

Plagiarism, according to the policy of Morgan State University, is not tolerated and students will be disciplined. The exact words or approximate words, or ideas of another person must be quoted and attributed. Students who fail to observe this rule will receive an “F” for the course. **Students are expected to do work independently. Though you may ask one another questions, you may not copy from one another.**

All work must be shown. All work must be neat and legible. Typed assignments is preferred.

Courtesy

Please silence cell phones and restrict use during class. Computers are available as a class aide and thus use outside of class related activities should be kept to a minimal.

Accommodations

Please seek the instructor immediately if special accommodations are necessary. These include but are not limited to disabilities and personal emergencies.

Suggested Reference Material

1. *Highway Capacity Manual (HCM 2010)*. 5th Edition. Transportation Research Board, National Research Council, Washington, DC.
2. *HCS 2010 Users Guide*
3. Trafficware Ltd., *Synchro Studio 8, Synchro plus SimTraffic and 3D Viewers*. 2011.
4. *Matlab Primer* http://www.mathworks.com/help/pdf_doc/matlab/getstart.pdf
5. *Matlab Tutorial* by Kelly Black <http://www.cyclismo.org/tutorial/matlab/#>
6. *An Introduction to Matlab for Engineering Students*
<https://www.mccormick.northwestern.edu/documents/students/undergraduate/introduction-to-matlab.pdf>

Tentative Course Schedule

Week	Date	Topics
Transportation data analysis		
1	1/26	Introduction, Excel basics
2	2/2	Excel – plotting, formulas, data manipulation
3	2/9	Excel – solver, data analysis toolpack
4	2/16	Excel – VBA & macros
5	2/23	Matlab – the basics: scripts, variables, vectors & matrices
6	3/2	Matlab – plotting, loops, if statement
7	3/9	Matlab – practice, advanced topics if time
8	3/16	PROJECT 1 DUE
--	3/23	☺ SPRING BREAK ☺
Traffic Engineering and Simulation		
9	3/30	HCS – Signalized Intersections
10	4/6	HCS – Unsignalized Intersections
11	4/13	HCS – Freeways, Weaving, Ramps
12	4/20	Synchro
13	4/27	Synchro
14	5/4	Synchro
15	5/11	PROJECT 2 DUE