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Fall 2019

# TRAN 615-851: Traffic Studies and Capacity

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Fall 2019
TRAN 615
**TRAFFIC STUDIES AND CAPACITY**
**Section: 851**


*Instructor:* Dr. J. Daniel
*Office:* 269 Fenster Hall
*Phone:* 973-642-4794
*Email:* daniel@njit.edu


Prerequisite: elementary probability and statistics. Presentation of the characteristics of the traffic stream, road users, and of vehicles, and a review of traffic flow relationships. Students are exposed to the principal methodologies followed by transportation practices to perform volume, speed, travel time, delay, accident, parking, pedestrian, transit and goods movement studies. Presentation of the principal methodologies used to perform transportation facility capacity analyses for: basic freeway sections, weaving areas, ramps and ramp junctions, multi-lane and two lane roadways, signalized and unsignalized intersections. Students get hands on experience using highway capacity software (HCS) and SIDRA. Same as CE 660.

"Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. **Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu

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| **Learning Objectives:** | The objective of this course is gain and understanding of highway capacity concepts and traffic studies used to evaluate the performance of transportation facilities. To be able to analyze the operation performance of interrupted flow facilities including: basic freeway sections, weaving areas, ramps and ramp junctions, multi-lane and two lane roadways |
| **Text:** | Roger P. Roess, Elena S. Prassas and William R. McShane, *Traffic Engineering*, Prentice-Hall Inc, 5th Edition 2019. |
| **Reference Text:** | *Highway Capacity Manual 6th Edition: A Guide for Multimodal Mobility Analysis. Transportation Research Board, National Research Council, Washington, D.C., 2016* |
| **Instructor Responsiveness:** | Emails will generally be responded to within 24-business hours Monday - Friday. |

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| **Canvas Tech Support:** | If you are unable to log in or experience a problem please contact the NJIT Helpdesk - (973) 596-2900. |
| **Grading:** | HW 20%<br>Tests(2) 50%<br>Final Test 30% |
| **Homework:** | Homework will not be thoroughly graded, but you will still need to turn in your homework. Credit will be provided based on your final answers given. No credit will be provided once solutions have been posted.<br><br>For homework assignments you should submit two items: (1) electronic copy of the completed homework (Word, pdf, excel); and (2) An excel spreadsheet I will provide to you with every homework assignment where you will input your final answers for your homework. You will not be able to include all of your answers in the excel spreadsheet. |
| **Electronic Submissions:** | You should identify how you will submit assignments electronically. You can submit all types of attachments (pdf, doc, xls). For some assignments which includes calculations, it may be easier to scan your written work into a pdf and submit that document, rather than type out the equations. Having access to a scanner or a printer with a feature to create pdfs may be helpful. Please avoid submitting attachments that are photos of your assignment as it is typically difficult for me to read these types of attachments. If you choose to submit excel spreadsheets, please note that I will not be able to look at your formula or how the calculation was determined. Therefore, you should show all the steps to get to your final calculation. |
| **Important Dates:** | Test #1 Wednesday, October 9, 2019 (6:00 pm – 7:30 pm)<br>Test #2 Wednesday, November 11, 2019 (6:00 pm – 7:30 pm)<br>Final Test Wednesday, December 11, 2019 (6:00 pm – 7:30 pm)<br><br>Please make all efforts to be available to take the exam during these dates and times. |
| **Exam Policy** | All exams are a 90 minutes administered through Canvas. Tests consists of various types of questions including some fill-in questions, some multiple choice questions, some calculation questions. The questions and some input variables will be randomly determined so each test will have some differences.<br><br>To save time, it is not necessary that you show your calculations during the test. You should, instead, provide your final answer during the test time and must submit any calculations used to reach the final answer after the completion of the test. The calculations are used to provide partial credit and to ensure that you did the work to complete the exam. No credit is provided for questions where the answer provided in the calculations differ from answers provided during the test. No credit is provided if you do not show your calculations. It is better to show your work from the test, where partial credit can be provided, than to recreate an answer. |

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| | Please save your answers as you go through the test. You can revise saved answers. The exam will close precisely 90 minutes after you begin, so please keep track of the time so you can submit your answers before time runs out. If you believe you are missing information to complete the question, please make an assumption and state your assumptions in the hand calculations.<br><br>To avoid technical difficulties with the online test, the computer help desk suggests using Firefox or Google chrome for your internet browser while using Canvas. Also your wireless connection can impact the ability to download figures or move from through the test questions without pausing. You may consider using a wired connection while taking the test. Please contact the university help desk if you would need clarification about connection problems. (973-596-2900). |

| **Week of** | **Topic** | **Reading** |
|---|---|---|
| 9/3 | Introduction – Traffic Flow Fundamentals | Chapters 1 and 5 |
| 9/9 | Introduction to Traffic Capacity Analysis | Chapter 7 and 28 |
| 9/16 | Multilane Highways Capacity Analysis | Chapter 28 |
| 9/23 | Weaving Area Capacity Analysis | Chapter 29 |
| 9/30 | Ramps and Ramp Terminal Capacity Analysis | Chapter 30 |
| **10/7** | **Test # 1 – Covering Chs. 1, 5, 7, 28** | |
| 10/14 | Two-Lane Rural Highways Capacity Analysis | Handout |
| 10/21 | Freeway Systems Capacity Analysis | Handout |
| 10/28 | Traffic Studies – Statistical Analysis | Handout |
| 11/4 | Volume Studies and Characteristics | Chapters 9 and 10 |
| **11/11** | **Test # 2 – Covering Chs. 29 and 30** | |
| 11/18 | Speed, Travel Time, and Delay Studies | Chapter 11 |
| 11/25 | Highway Traffic Safety Studies | Chapter 12 |
| 12/2 | Highway Traffic Safety Studies | Chapter 12 |
| **12/9** | **Final - Covering Chs 9 – 12, Two-Lane Hwys, Freeway Systems, Statistical Analysis** | |