

MS Program Standards/Guidelines

Transportation Engineering

Students wishing to receive an MS degree in Civil and Environmental Engineering with emphasis in transportation engineering must satisfy the appropriate college and university requirements and generally satisfy those outlined below.

Preparatory/Undergraduate Core Courses

Although an undergraduate degree in civil engineering is not required as a prerequisite to the program in transportation engineering, students who do not have a BS in civil engineering will normally be required to complete those undergraduate courses which provide appropriate background. Required undergraduate preparation would generally include mathematics through differential equations, and STT 351 (an introductory course in statistics) or an equivalent. A general introductory course in transportation (e.g., CE 341) or one in a specific area (i.e., traffic engineering, highway design, and transportation planning) is also desirable. While 300 (junior)-level courses do not count toward the program requirements *per se*, a limited number of 400 (senior)-level classes (12 credits) can be used as part of the program.

MS Core Courses (21-22 credits)

Core courses (21-22 credits) provide exposure to the various aspects of transportation and background in statistics (which is implicit in the 400-level transportation classes and selected others). Each student must satisfy the core requirements with additional electives being taken within transportation or a related area depending on a student's interests. Some of the core requirements can be satisfied by showing that equivalent courses have been taken elsewhere or at the undergraduate level. This serves to increase the number of electives that a student can take as part of his/her program.

Required 400-level Core Courses (9-10 credits)

CE 444	Traffic Engineering
CE 448	Transportation Planning
CE 449	Highway Design

Students must either take these classes or show that they have taken equivalent courses in their undergraduate program. If they have taken them as undergraduates, more elective courses/credits are allowed. While CE 449 is currently (2002-2003) a 4-credit course, it is expected to be reduced to three (3) in 2003-2004.

Required 800-level Core Courses (12 credits)

CE 841	Traffic Flow Theory
CE 844	Highway and Traffic Safety
CE 847	Simulation Models for Transportation Applications
CE 849	Transportation Research Methods

Elective Courses (9 credits or more depending on option and prior coursework)

Each student must also choose electives which provide **depth** in his/her chosen area of specialization within transportation as well as appropriate **breadth**. These courses are to be selected in conjunction with and approved by the student' s faculty advisor. (See attached listing.)

Transportation Electives (6 credits)

MS students must choose courses totaling at least 6 credits from the following list of transportation electives within the program:

CE 843	Simulation and Optimization of Urban Traffic Flow ¹
CE 845	Intermodalism and Public Transportation
CE 846	Statewide Transportation Network Evaluation
CE 850	Intelligent Transportation Systems (ITS)
CE 851	Transportation and Environment

Note: 1. course is available only during the summer and only in Russia as part of “study abroad” activities.

Other Related Electives (3 or more credits)

Other electives can be selected (in consultation with the student’s advisor) from the approved list (see next page), from the list of transportation electives (above), or from offerings by other departments.

Project or MS Thesis Requirements (3 or more credits)

All graduate students in the program who receive financial assistance during their studies via an appointment as a teaching or research assistant are required to complete either an MS thesis or master’s research project (CE 892). If a student is un-supported throughout his/her program (e.g., completes the program on a part-time basis while working), the course-work-only option is available. Unsupported students may also opt to undertake a research project or thesis. For the project/thesis option, the student is required to form a three-member MS committee. Students electing to take an MS thesis are governed by department and college rules. For the MS project, the student will take a three-five (3-5) credit project (CE 892) for which he/she will have to prepare a written report and undertake an oral defense before the MS committee. The topic of the project/thesis is approved by the student’ s faculty advisor.

CE 892	Master’s Research Project (3 or more credits)
CE 899	Master’s Thesis Research (3 or more credits)

**COURSE LISTINGS FOR OTHER ELECTIVES
TRANSPORTATION ENGINEERING**

please note that this is a partial listing—other courses could also be selected depending on student interest and direction

also note that courses below may have pre-requisites which are not listed

Civil and Environmental Engineering

- CE 431 Pavement Design and Analysis I
- CE 432 Pavement Rehabilitation
- CE 462 Technical Communication
- CE 471 Construction Engineering—Equipment, Methods, and Planning
- CE 831 Pavement Design and Analysis II
- CE 835 Engineering Management of Pavement Networks
- CE 890 Independent Study in Civil Engineering
- CE 891 Selected Topics in Civil Engineering

Urban Planning

- UP 463 Introduction to Quantitative Methods for Geographers and Planners
- UP 801 Concepts and Issues in Planning and Development
- UP 814 Applied Research Methods for Planning and Development
- UP 844 Decision Theory for Urban Planning and Development
- UP 848 Urban Policy Analysis
- UP 865 Planning and Development Law
- UP 867 Methods and Modeling in Regional Science

Geography

- GEO 413 Urban Geography
- GEO 414 Geography of Transportation
- GEO 415 Location Theory and Land Use Analysis
- GEO 425 Geographic Information Systems
- GEO 454 Spatial Aspects of Regional Development
- GEO 867 Methods and Modeling in Regional Science

Statistics

- STT 471 Statistics for Quality and Productivity
- STT 825 Sample Survey
- STT 826 Nonparametric Statistics
- STT 841 Linear Statistical Models
- STT 842 Categorical Data Analysis
- STT 843 Multivariate Analysis
- STT 844 Time Series Analysis
- STT 852 Stochastic Methods in Operations Research

Resource Development

- RD 415 Environmental Impact Assessment
- RD 867 Methods and Modeling in Regional Science

Business Administration

- MSC 876 Logistics Operations Methods and Systems
- MSC 877 Logistics Information Technology
- MSC 833 Decision Support Models

Agricultural Economics

- AEC 839 Applied Operations Research