

M.S. in Critical Infrastructure Systems

Degree Requirements

For students lacking an appropriate background, a customized program of bridge courses will be developed in consultation with the graduate advisor, in order to address potential deficiencies. Students with engineering, management, computer science or general sciences degree are required to have some background in probability and statistics. Such a background can be obtained by taking a bridge course such as MATH 279 Statistics & Probability for Engr.

A minimum of 30 degree credits is required (excluding bridge courses). Students must consult with their graduate advisor to develop a suitable program of study. A minimum GPA of 3.0 must be maintained in core courses and overall. Students who receive financial aid as Research Assistants must complete 6 credits of Master's Thesis.

With permission of their research advisor, students intending to do an MS thesis should first register in the CE 700B (Masters Project). Students must receive a satisfactory (S) grade in 700B before registering for CE 701B (Master's Thesis). Students taking CE 701B must register in the immediate following semester with the same advisor. The MS thesis topic should be continuation of the work done in CE 700B.

Master of Science in Critical Infrastructure Systems

Code	Title	Credits
Core Courses		9
Students may select from the courses listed below.		
CE 613	Resilient Systems Planning and Design	
CE 671	Performance and Risk Analysis of Infrastructure Systems	
CE 672	Security Management of Critical Infrastructure	
EM 602	Management Science	
MIP 675	Elements of Infrastructure Planning	
Specialty Electives		12-21
Students may select from the courses listed below.		
CE 602	Geographic Information System	
CE 612	Machine Learning and Data Analytics for Civil Engineering Systems	
CE 614	Underground Construction	
CE 615	Infrastructure and Facilities Remediation	
CE 635	Fracture Mechanics of Engineering Materials	
CE 637	Short Span Bridge Design	
CE 638	Nondestructive Testing Methods in Civil Engineering	
CE 662	Deep Underground Engineering and Resources	
CE 700B	Masters Project	
CE 701B	Master's Thesis	
CE 701C	Master's Thesis	
CE 702	Special Topics in Civil Engineering	
CE 703	Concrete Durability	
CE 711	Methods Improvement in Construction	
CE 720	Water Resource Systems	
CE 725	Independent Study I	
CE 726	Independent Study II	
CE 727	Independent Study III	
ENE 660	Introduction to Solid and Hazardous Waste Problems	
ENE 662	Site Remediation	
ENE 671	Environmental Impact Analysis	
ENE 672	Stormwater Management	
ENE 673	Sustainability and Life Cycle Analysis	
ENE 700B	Master's Project	
ENE 701B	Master's Thesis	
ENE 701C	Master's Thesis	

ENE 702	Special Topics in Environmental Engineering
ENE 703	Biogeochemical Applications in Environmental Engineering
ENE 720	Environmental Chemodynamics
ENE 725	Independent Study I
ENE 726	Independent Study II
IE 605	Engineering Reliability
IE 614	Safety Engineering Methods
IE 621	Systems Analysis and Simulation
TRAN 608	Behavioral Issues in Transportation Studies
TRAN 625	Public Transportation Operations and Technology
TRAN 640	Distribution Logistics
TRAN 643	Transportation Finance
TRAN 650	Urban Systems Engineering
TRAN 653	Traffic Safety
TRAN 655	Land Use Planning
TRAN 659	Flexible and Rigid Pavements
TRAN 700B	Master'S Project
TRAN 701B	Master's Thesis
TRAN 701C	Master'S Thesis
TRAN 702	Topics In Transportation
TRAN 705	Mass Transportation Systems
TRAN 720	Discrete Choice Modeling for Travel Demand Forecasting
TRAN 725	Independent Study
TRAN 726	Independent Study II
TRAN 752	Traffic Control
TRAN 753	Airport Design and Planning
TRAN 754	Port Design and Planning
TRAN 755	Intelligent Transportation Systems
TRAN 760	Urban Trans Networks
TRAN 765	Multi-modal Freight Transportation Systems Analysis

Management/Leadership Electives**0-9**

Students may select from the courses listed below.

CE 610	Construction Management
CE 611	Project Planning and Control
CE 616	Construction Cost Estimating
CE 711	Methods Improvement in Construction
ACCT 615	Management Accounting
FIN 600	Corporate Finance I
EM 632	Legal Aspects in Construction
HRM 601	Managing Organizational Behavior in Technology-Based Organizations
MGMT 635	Data Mining and Analysis

Total Credits**30**