M.S. in Civil Engineering

Degree Requirements

Students who do not have a bachelor's degree in civil engineering, but who want to obtain a master's degree in civil engineering must complete a bridge program for their chosen area of specialization. These courses are not counted for degree credit. See the areas of specialization in this section for specific bridge programs. Please note that prerequisites for bridge courses also must be met. See the undergraduate catalog for descriptions of 100- to 400-level courses. Some of the bridge courses may be waived depending on the student's background.

The program as shown below offers numerous areas of specialization, each with its own list of required and elective courses and bridge program. Students must maintain a minimum GPA of 3.0 in core courses and a minimum overall GPA of 3.0. Once the choice of specialization is made, the student consults his/her specialization advisor to plan and develop an individualized and cohesive sequence of courses that will meet the program requirements of at least 30 graduate degree credits.

Other suitable electives may be taken subject to approval of program advisor.

Students are able to substitute Master's thesis in their program. 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 (Masters 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.

M.S. in Civil Engineering, Construction Engineering and Management

Code	Title	Credits
Bridge Program		
CE 210	Construction Materials and Procedures	3
CE 200	Surveying	2
CE 200A	Surveying Laboratory	1
MECH 320	Statics and Strength of Materials	3
CS 101	Computer Programming and Problem Solving	3
MATH 112	Calculus II	4
MATH 279	Statistics and Probability for Engineers	2
CE 341	Soil Mechanics	3
CE 341A	Soil Mechanics Laboratory	1
Total Credits		**22**

Code	Title	Credits
Core Courses		
6 credits as follows:		6
CE 610	Construction Management	
CE 611	Project Planning and Control	
Specialty Electives		
12 to 18 credits as follows:		12-18
CE 614	Underground Construction	
CE 615	Infrastructure and Facilities Remediation	
CE 616	Construction Cost Estimating	
CE 617	Historic Preservation	
CE 644	Applied Engineering Geology	
CE 671	Performance and Risk Analysis of Infrastructure Systems	
CE 711	Methods Improvement in Construction	
CE 700B	Masters Project	
CE 701B	Master's Thesis	
EM 632	Legal Aspects in Construction	
General Electives		
0 to 6 credits of General Department Electrives		0-6
Management/Leadership Electives		

3 to 6 credits as follows:		0-6
ACCT 615	Management Accounting	
FIN 600	Corporate Finance I	
EPS 622	Sustainable Politics and Policy	
HRM 601	Managing Organizational Behavior in Technology-Based Organizations	
Total Credits		**30**

M.S. in Civil Engineering, Environmental Engineering, Water Quality Program

Code	Title	Credits
Water Quality Bridge Program		
CE 320	Fluid Mechanics	3
CE 321	Water Resources Engineering	3
CHEM 126	General Chemistry II	3
Total Credits		**9**

Code	Title	Credits
Core Courses		
ENE 663	Water Chemistry	3
ENE 661	Environmental Microbiology	3
or EVSC 627	Environmental Microbiology	
Specialty Electives		
12 to 18 credits as follows:		12-18
ENE 664	Physical and Chemical Treatment	
ENE 665	Biological Treatment	
ENE 672	Stormwater Management	
CE 671	Performance and Risk Analysis of Infrastructure Systems	
ENE 700B	Master's Project	
ENE 701B	Master's Thesis	
General Electives		
0 to 6 credits of General Department Electives		0-6
Management/Leadership Electives		
3 to 6 credits as follows:		3-6
CE 610	Construction Management	
CE 711	Methods Improvement in Construction	
EM 631	Legal Aspects in Environmental Engineering	
HRM 601	Managing Organizational Behavior in Technology-Based Organizations	
Total Credits		**30**

M.S. in Civil Engineering, Environmental Engineering Integrated Site Remediation

Code	Title	Credits
Integrated Site Remediation Bridge Program		
CHEM 126	General Chemistry II	3
CE 321	Water Resources Engineering	3
CE 501	Introduction to Soil Behavior	3
Total Credits		**9**

Code	Title	Credits
Core Courses		
ENE 663	Water Chemistry	3
ENE 661	Environmental Microbiology	3
or EVSC 627	Environmental Microbiology	
Specialty Electives		

12 to 18 credits as follows:		12-18
ENE 660	Introduction to Solid and Hazardous Waste Problems	
ENE 662	Site Remediation	
ENE 671	Environmental Impact Analysis	
CE 602	Geographic Information System	
ENE 700B	Master's Project	
ENE 701B	Master's Thesis	
General Electives		
0 to 6 credits of General Department Electives		0-6
Management/Leadership Electives		
3 to 6 credits as follows:		3-6
CE 610	Construction Management	
CE 711	Methods Improvement in Construction	
EM 631	Legal Aspects in Environmental Engineering	
HRM 601	Managing Organizational Behavior in Technology-Based Organizations	
Total Credits		**30**

M.S. in Civil Engineering, Geotechnical Engineering

Code	Title	Credits
Bridge Program		
CE 320	Fluid Mechanics	3
CE 332	Structural Analysis	3
CE 333	Reinforced Concrete Design	2
CE 341	Soil Mechanics	3
CE 341A	Soil Mechanics Laboratory	1
CE 443	Foundation Design	3
CS 101	Computer Programming and Problem Solving	3
MATH 322	Differential Equations for Applications	3

Core Courses

Students must attain a minimum GPA of 3.0 in the three core courses listed below:

Code	Title	Credits
Core Courses		
CE 641	Engineering Properties of Soils	3
CE 643	Advanced Foundation Engineering	3
CE 648	Flow Through Soils	3
Advanced Geotechnical Design Courses		
6 to 9 credits as follows:		
CE 642	Foundation Engineering	
CE 647	Geotechnical Aspects of Solid Waste	
CE 700B	Masters Project	
CE 742	Geotechnology of Earthquake Engineering	
CE 646	Geosynthetics & Soil Imp	
Geology/Rock Mechanics Courses		
3 to 6 credits as follows:		0-6
CE 644	Applied Engineering Geology	
CE 614	Underground Construction	
CE 602	Geographic Information System	
Pending Extraction and Storage of Energy Resources		
General Electives		
0 to 12 credits as follows:		

Pavements	
CE 553	Design and Construction of Asphalt Pavements
CE 649	Design & Construction of Concr
CE 659	Flexible and Rigid Pavements
CE 702	Special Topics in Civil Engineering
Pending Management of Infrastructure Assets	
Structural	
CE 615	Infrastructure and Facilities Remediation
CE 631	Advanced Reinforced Concrete Design
CE 638	Nondestructive Testing Methods in Civil Engineering
Numerical Methods	
ME 622	Finite Element Methods in Mechanical Engineering
MATH 614	Numerical Methods I
Management/Leadership Electives	
3 to 6 credits as follows:	
CE 610	Construction Management
CE 611	Project Planning and Control
CE 616	Construction Cost Estimating
CE 711	Methods Improvement in Construction
EM 632	Legal Aspects in Construction
HRM 601	Managing Organizational Behavior in Technology-Based Organizations
CE 701B	Master's Thesis

Students pursuing a thesis option or receiving financial aid at any point in their studies must complete a minimum of 6 credits of CE 701 Master's Thesis in place of 3 credits reduction from the Advanced Geotechnical Design Courses Requirements and 3 Credits reduction from the Management/ Leadership

M.S. in Civil Engineering, Structural Engineering

Code	Title	Credits
Bridge Program		
CE 333	Reinforced Concrete Design	2
CE 341	Soil Mechanics	3
CE 341A	Soil Mechanics Laboratory	1
CE 360	Sustainable Civil Engr Mat	3
CE 432	Steel Design	2
CS 101	Computer Programming and Problem Solving	3
MATH 222	Differential Equations	4
MECH 236	Dynamics	2
MECH 237	Strength Of Materials	3
Total Credits		**23**

Code	Title	Credits
Core Courses		
CE 630	Matrix Analysis of Structures	3
CE 634	Structural Dynamics	3
CE 636	Mechanics and Stability of Structures	3
Advanced Design Courses		
9 credits from the following:		9
CE 631	Advanced Reinforced Concrete Design	
CE 632	Prestressed Concrete Design	
CE 637	Short Span Bridge Design	
CE 700B	Masters Project	
CE 733	Design of Metal Structures	

CE 734	Design of Tall Buildings and Space Structures	
Advanced Materials Course		
3 credits from the following:		3
CE 638	Nondestructive Testing Methods in Civil Engineering	
CE 703	Concrete Durability	
MTSE 601	Fundamentals of Engineering Materials	
MTSE 602	Thermodynamics of Materials	
MTSE 610	Mechanical Properties of Materials	
Construction/Management/Leadership Courses		
6 credits from the following:		6
CE 610	Construction Management	
CE 611	Project Planning and Control	
CE 616	Construction Cost Estimating	
CE 711	Methods Improvement in Construction	
EM 632	Legal Aspects in Construction	
HRM 601	Managing Organizational Behavior in Technology-Based Organizations	
CE 701B	Master's Thesis	
Geotechnical and Foundation Engineering Courses		
3 credits from the following:		3
CE 641	Engineering Properties of Soils	
CE 642	Foundation Engineering	
CE 643	Advanced Foundation Engineering	
Total Credits		**30**

M.S. in Civil Engineering, Transportation Engineering

Code	Title	Credits
Bridge Program		
CE 200	Surveying	2
CE 200A	Surveying Laboratory	1
CE 350	Transportation Engineering	3
CS 101	Computer Programming and Problem Solving	3
ECON 265	Microeconomics	3
MATH 105	Elementary Probability and Statistics	3
MATH 309	Mathematical Analysis for Technology	4
Total Credits		**19**

Code	Title	Credits
Core Courses		
6 credits as follows		
TRAN 615	Traffic Studies and Capacity	3
TRAN 650	Urban Systems Engineering	3
Specialty Electives		
12 to 18 credits as follows:		12-18
CE 659	Flexible and Rigid Pavements	
TRAN 552	Geometric Design of Transportation Facilities	
TRAN 603	Introduction to Urban Transportation Planning	
TRAN 625	Public Transportation Operations and Technology	
TRAN 653	Traffic Safety	
TRAN 655	Land Use Planning	
TRAN 700B	Master'S Project	
TRAN 701B	Master's Thesis	
TRAN 752	Traffic Control	

TRAN 755	Intelligent Transportation Systems	
General Electives		
0 to 6 credits as follows:		0-6
See List of Department General Electives		
Management/Leadership Electives		
3 to 6 credits as follows:		6
CE 610	Construction Management	
CE 711	Methods Improvement in Construction	
EM 632	Legal Aspects in Construction	
HRM 601	Managing Organizational Behavior in Technology-Based Organizations	
Total Credits		**30**