M.S. in Civil Engineering

Degree Requirements

The Master of Science in Civil Engineering is granted to students who complete the course work described below. Students may choose Non-Thesis or Thesis Option.

Non-Thesis Option

CIV Required Courses	12
Electives	18
Total Credits	**30**

Thesis Option

Civil Engineering Required Courses	12
Electives	9
Thesis Research (3 cr of CIV 700A plus 6 cr of Thesis Research)	9
Total Credits	**30**

Transportation Engineering Track

Required courses		**12**
CIV 506	Transportation Systems Engineering	
CIV 522	Advanced Geometric Design of Highways and Streets	
CIV 532	Transportation Planning	
CIV 602	Transportation Safety	
Transportation Electives		**18**
Max 12 credits outside CIV		
BA 511	Operations Research	
BA 514	Strategic Marketing Management in Aviation	
BA 604	International Management and Aviation Policy	
BA 645	Airport Operations and Management	
BA 650	Airline/Airport Relations	
BA 651	Strategic Airport Planning	
CIV 510	Design and Analysis of Airfield and Highway Pavement	
CIV 512	Intelligent Transportation Systems	
CIV 520	Railroad Engineering and High Speed Rail	
CIV 524	Access Management	
CIV 534	Transportation Simulation and Modeling	
CIV 604	Advanced Signal Control and Design	
DS 540	Data Mining	
HFS 600	Human Factors in Systems	
HFS 616	Human Factors of Transportation	
MA 505	Statistics I	
MA 506	Probability and Statistical Inference	
MSA 508	Advanced Airport Modeling	
MSA 511	Earth Observation and Remote Sensing	
MSA 540	The Air Transportation System	
MSA 554	Project Management in Aviation Aerospace	
MSA 662	Statistical Analysis for Aviation/Aerospace	
Total Credits		**30**

Structural Engineering Track

Required Courses		**12**
AE 514	Introduction to the Finite Element Method	
CIV 514	Advanced Concrete Analysis and Design	
CIV 516	Advanced Steel Analysis and Design	
CIV 526	Advanced Foundation Engineering	
Structures Electives		**18**
Max 9 credits outside CIV		
AE 502	Strength and Fatigue of Materials	
AE 510	Aircraft Structural Dynamics	
AE 523	Linear Systems	
AE 532	Failure Analysis of Materials	
CIV 502	Wind Engineering	
CIV 504	Bridge Engineering	
CIV 510	Design and Analysis of Airfield and Highway Pavement	
CIV 518	Structural Reliability	
CIV 528	Structural Health Monitoring in Civil Infrastructure	
CIV 530	Composites in Civil Infrastructure	
ME 525	Structural Design Optimization	
Total Credits		**30**

General Civil Engineering Track

Required Courses		**12**
CIV 506	Transportation Systems Engineering	
or CIV 532	Transportation Planning	
CIV 514	Advanced Concrete Analysis and Design	
or CIV 516	Advanced Steel Analysis and Design	
CIV 510	Design and Analysis of Airfield and Highway Pavement	
or CIV 526	Advanced Foundation Engineering	
CIV 508	Environmental Engineering	
Civil Electives		**18**
Non-Thesis Option:		
CIV Graduate Electives (Advisor approved (6-18 credits)		
Non-CIV Graduate Electives (Advisor approved) (0-12 credits)		
Total Credits		**30**

Environmental Sustainability & Resilience Track

Required Courses		**12**
CIV 508	Environmental Engineering	
or CIV 540	Drainage Engineering	
CIV 536	Advanced Flood Modeling	
or CIV 538	Air Pollution Control	
CIV 542	Environmental Data Science	
CIV 544	Environmental Sustainability and Resilience	
General Electives		**9**
CEC 526	Sensor Data Fusion	
CEC 530	Image Processing and Machine Vision	
CIV 502	Wind Engineering	
CIV 526	Advanced Foundation Engineering	
CIV 528	Structural Health Monitoring in Civil Infrastructure	
DS 540	Data Mining	
DS 544	Data Visualization	
EP 501	Numerical Methods for Engineers and Scientists	
EP 708	Remote Sensing: Active and Passive	
EP 712	Geophysical Fluid Dynamics	
MA 506	Probability and Statistical Inference	
MA 553	High Performance Scientific Computing	
MA 588	Numerical Methods in Fluids	
ME 500	Clean Energy Systems	

MHSR 530	Environmental Security	
MHSR 540	Foundations of Resilience	
MSA 511	Earth Observation and Remote Sensing	
MSES 550	Atmospheric Conditions in Emergency Services	
RSCH 665	Statistical Analysis	
SFTY 530	Safety, Health and Environmental Legislation, Litigation & Compliance	
WEAX 517	Advanced Meteorology	
Thesis		**9**
CIV 700	Thesis	
Total Credits		**30**

Geomechanics & Geotechnical Engineering Track

Required Courses		
CIV 526	Advanced Foundation Engineering	3
CIV 548	Numerical Methods in Geotechnical Engineering	3
CIV 552	Advanced Soil Mechanics	3
CIV 556	Risk and Reliability in Geotechnical Engineering	3
Geomechanics & Geotechnical Engineering Electives		
Max 9 credits outside CIV		
AE 514	Introduction to the Finite Element Method	3
CIV 502	Wind Engineering	3
CIV 510	Design and Analysis of Airfield and Highway Pavement	3
CIV 528	Structural Health Monitoring in Civil Infrastructure	3
CIV 546	Designing with Geosynthetics	3
CIV 550	Unsaturated Soil Mechanics	3
CIV 554	Soil Dynamics and Earthquake Engineering	3
DS 540	Data Mining	3
DS 544	Data Visualization	3
EP 501	Numerical Methods for Engineers and Scientists	3
EP 708	Remote Sensing: Active and Passive	3
EP 712	Geophysical Fluid Dynamics	3
MA 506	Probability and Statistical Inference	3
MA 553	High Performance Scientific Computing	3
MA 588	Numerical Methods in Fluids	3
MSA 511	Earth Observation and Remote Sensing	3
MHSR 530	Environmental Security	3
MHSR 540	Foundations of Resilience	3
Thesis		**9**
CIV 700	Thesis	
Total Credits		**30**