

# Civil Engineering

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## College of Engineering

The Department of Civil Engineering offers the Master of Science in Civil Engineering (Plan A and Plan B available), and Ph.D. with specialization in the following areas:

Civil Engineering Materials  
Construction Engineering and Management  
Environmental Engineering  
Geotechnical Engineering  
Hydraulics Engineering  
Structural Engineering  
Transportation Engineering  
Water Resources Engineering

These areas utilize courses from other departments and such inter-departmental programs are encouraged. Mechanical Engineering, Chemical Engineering, Agricultural Engineering, Mining Engineering, Mathematics, Computer Science, Geology, Biology, and Chemistry are some of the departments whose offerings contribute to the programs in Civil Engineering.

For the Master of Science in Civil Engineering (M.S.C.E.) degree Plan A, 24 credit hours of course work and a thesis are required to fulfill degree requirements. For the Master of Science in Civil Engineering (M.S.C.E.) degree Plan B, a minimum of 30 credit hours of graduate work are required, including at least 3 credit hours of independent work. The requirement for independent work may be satisfied by either taking an approved curriculum of courses which contain integral independent study components totaling a minimum of 3 credit hours, or by completing at least three credit hours of CE 790 and/or CE 791.

Students who wish to complete the independent work requirement by choosing from an approved curriculum of courses containing integral independent study components, shall present a plan of study which satisfies this requirement, and all other Graduate School requirements, to the Director of Graduate Studies for approval before the completion of 12 credit hours of graduate course work. Preferably this should occur no later than the end of the first semester of graduate residence. The requirement for all independent work must be satisfied under the direction of one faculty member (for students choosing a CE 790 and/or CE 791), or several faculty members (for students following an approved curriculum of courses), who will assign, monitor, and evaluate the student's work as part of the specific course. Written reports will usually represent the work product to be evaluated.

All students must pass a Final Examination as specified by the rules of the Graduate School. The contents and style of the examination, and the evaluation of the student's performance, are the responsibility of a Graduate Faculty committee appointed by the Dean of the Graduate School. The Ph.D. degree has no formal course requirement, but students must pass the Qualifying Examination before entering candidacy. There is no language requirement for the M.S.C.E. and Ph.D. degrees in Civil Engineering.

### **Admission Requirements**

In addition to satisfying general Graduate School and College of Engineering admissions requirements (a GPA of 2.8/4.0 on all undergraduate work is normally required), applicants for admission to the M.S.C.E., and Ph.D. degree programs in Civil Engineering must have been awarded a Bachelor of Science degree

from an engineering program accredited by the Accrediting Board for Engineering and Technology (ABET). This requirement may be waived for applicants who have been awarded bachelor's degrees other than in engineering or from unaccredited engineering programs (including those offered by foreign institutions) if the applicant has received an acceptable score on the Graduate Record Examination (GRE).

Students with undergraduate majors not in engineering must also take a certain number of undergraduate remedial courses. Neither the M.S.C.E. degree nor the Ph.D. degree in Civil Engineering will be conferred unless the candidates have successfully completed, during their undergraduate and/or graduate careers, at least one basic course in at least four of the following seven areas: civil engineering materials, construction engineering and management, environmental engineering, geotechnical engineering, hydraulics and water resources engineering, structural engineering, and transportation engineering.

Another admission requirement is a minimum combined verbal and quantitative scores of GRE as follows: 1000 (300: New GRE), and 1100 (330: New GRE) for Master's and Ph.D. degree applicants, respectively. Scores on the analytical portion are not considered. Foreign applicants whose native language is other than English must take the Test of English as a Foreign Language (TOEFL) and score at least 550 (Computer Based TOEFL: 213, iBT TOEFL: 80).

The Department of Civil Engineering has many well-equipped laboratories with active research programs in most areas. The research programs provide financial assistance for graduate students. In addition, financial assistance is available through teaching assistantships, fellowships, and scholarships.

Information about the graduate program in Civil Engineering can be obtained by writing the Director of Graduate Studies, Department of Civil Engineering.

## Graduate Courses

CE 461G	Hydrology	(3)
CE 471G	Soil Mechanics	(4)
CE 486G	Reinforced Concrete Structures	(3)
CE 487G	Steel Structures	(3)
CE 508	Design And Optimization Of Construction Operations	(3)
CE509	Control Of The Construction Project	(3)
CE517	Boundary Location Principles	(3)
CE 525	CE Applications Of Geographic Information Systems	(3)
CE 531	Transportation Facilities Design And Operations	(3)
CE 533	Railroad Facilities Design And Analysis	(3)
CE 534	Pavement Design, Construction And Management	(3)
CE 539	Transportation Systems Design	(3)
CE 541	Intermediate Fluid Mechanics (Same As BAE 541)	(3)
CE 542	Introduction To Stream Restoration (Same As BAE 532)	(3)
CE 546	Fluvial Hydraulics (Same As BAE 536)	(3)
CE 547	Watershed Sedimentation (Same As BAE 547)	(3)
CE 549	Engineering Hydraulics(Same As BAE 545)	(3)
CE 551	Water And Wastewater Treatment Engineering	(3)
CE 553	Environmental Consequences Of Energy Production (Same As EGR 553)	(3)
CE 555	Microbial Aspects Of Environmental Engineering	(3)
CE 568	GIS Applications For Water Resources (Same As BAE 538)	(3)
CE 579	Geotechnical Engineering	(3)
CE 581	Civil Engineering Materials Ii	(3)

CE 582	Advanced Structural Mechanics	(3)
CE 584	Design Of Timber And Masonry Structures	(3)
CE 585	Civil Engineering Failure	(3)
CE 586	Prestressed Concrete	(3)
CE 589	Design Of Structural Systems	(3)
CE 599	Topics In Civil Engineering (Subtitle Required)	(1-4)
CE 602	Construction Project Management	(3)
CE 605	New Engineering Enterprises	(3)
CE 621	Introduction To Finite Element Analysis	(3)
CE 631	Urban Transportation Planning	(3)
CE 633	Air Transport Engineering	(3)
CE 634	Traffic Characteristics	(3)
CE 635	Highway Safety	(3)
CE 642	Open Channel Flow (Same As BAE 642)	(3)
CE 643	Mechanics Of Sediment Transport	(3)
CE 651	Fundamentals Of Water Quality Control I	(3)
CE 652	Fundamentals Of Water Quality Control Ii	(3)
CE 653	Water Quality In Surface Waters (Same As BAE 653)	(3)
CE 655	Water Sanitation And Health	(3)
CE 662	Stochastic Hydrology (Same As BAE 667)	(3)
CE 664	Watershed Management	(3)
CE 665	Water Resources Systems	(3)
CE 667	Stormwater Modeling	(3)
CE 671	Advanced Soil Mechanics	(3)
CE 672	Landfill Design	(3)
CE 673	Stability Of Earth Slopes	(3)
CE 676	Groundwater And Seepage	(3)
CE 679	Geotechnical Earthquake Engineering	(3)
CE 681	Advanced Civil Engineering Materials	(3)
CE 682	Advanced Structural Analysis	(3)
CE 684	Slab And Folded Plate Structures	(3)
CE 686	Advanced Reinforced Concrete Theory	(3)
CE 687	Advanced Metal Structures	(3)
CE 699	Topics In Civil Engineering (Subtitle Required)	(1-4)
CE 748	Master's Thesis Research	(0)
CE 749	Dissertation Research	(0)
CE 767	Dissertation Residency Credit	(2)
CE 768	Residence Credit For Master's Degree	(1-6)
CE 769	Residence Credit For Doctor's Degree	(0-12)
CE 779	Advanced Geotechnical Engineering	(3)
CE 782	Dynamics Of Structures	(3)
CE 783	Structural Finite Element Analysis	(3)
CE 784	Shell Structures	(3)
CE 790	Special Research Problems In Civil Engineering	(1-6)
CE 791	Special Design Problems In Civil Engineering	(1-6)