Civil Engineering

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**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CE 461G</td>
<td>Hydrology</td>
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<td>CE 471G</td>
<td>Soil Mechanics</td>
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<td>CE 486G</td>
<td>Reinforced Concrete Structures</td>
<td>(3)</td>
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<td>CE 487G</td>
<td>Steel Structures</td>
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<tr>
<td>CE 508</td>
<td>Design And Optimization Of Construction Operations</td>
<td>(3)</td>
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<td>CE 509</td>
<td>Control Of The Construction Project</td>
<td>(3)</td>
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<td>CE 517</td>
<td>Boundary Location Principles</td>
<td>(3)</td>
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<tr>
<td>CE 525</td>
<td>CE Applications Of Geographic Information Systems</td>
<td>(3)</td>
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<tr>
<td>CE 531</td>
<td>Transportation Facilities Design And Operations</td>
<td>(3)</td>
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<td>CE 533</td>
<td>Railroad Facilities Design And Analysis</td>
<td>(3)</td>
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<td>CE 534</td>
<td>Pavement Design, Construction And Management</td>
<td>(3)</td>
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<td>CE 539</td>
<td>Transportation Systems Design</td>
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<td>CE 541</td>
<td>Intermediate Fluid Mechanics (Same As BAE 541)</td>
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<td>CE 542</td>
<td>Introduction To Stream Restoration (Same As BAE 532)</td>
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<td>CE 546</td>
<td>Fluvial Hydraulics (Same As BAE 536)</td>
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<td>CE 547</td>
<td>Watershed Sedimentation (Same As BAE 547)</td>
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<td>CE 549</td>
<td>Engineering Hydraulics(Same As BAE 545)</td>
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<td>CE 551</td>
<td>Water And Wastewater Treatment Engineering</td>
<td>(3)</td>
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<td>CE 553</td>
<td>Environmental Consequences Of Energy Production (Same As EGR 553)</td>
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<td>CE 555</td>
<td>Microbial Aspects Of Environmental Engineering</td>
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<td>CE 568</td>
<td>GIS Applications For Water Resources (Same As BAE 538)</td>
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<td>CE 579</td>
<td>Geotechnical Engineering</td>
<td>(3)</td>
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<tr>
<td>CE 581</td>
<td>Civil Engineering Materials II</td>
<td>(3)</td>
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</tbody>
</table>
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)