CIVIL ENGINEERING, MS

The department offers programs leading to the Master of Science in civil engineering, Master of Science in engineering (environmental engineering) and Doctor of Philosophy degrees in civil engineering. Research programs in the department include environmental quality and water resources; management and safety of transportation systems; structural engineering including assessment, renewal, and protection of infrastructure; and construction engineering and management. Laboratory facilities are provided for graduate research and instruction in these and other areas.

Admissions

In addition to the minimum Graduate School admission requirements, to be considered for regular admission, an applicant should have enrolled in a baccalaureate degree from an institution accredited by the Engineering Accreditation Council (EAC) of ABET Inc. Applications from a non-EAC/ABET-accredited program will also be considered. The requirements for regular admission include

- enrolled in a Bachelor's degree in civil, construction, environmental engineering, or related fields at the time of application. A completed bachelor's degree is required prior to enrollment in the graduate program.
- A combined verbal and quantitative GRE requirement of 300 or greater (see below for exceptions). Applicants with three or more years of field-related post-Bachelor's work experience may inquire about a GRE waiver request by contacting the Graduate Program Director **after** submitting a complete application with a detailed resume. There is no minimum score on the writing section of the GRE for admission to the MS Program.
- A current Resume.
- A concise Statement of Purpose. This short document should describe the reasons for pursuing an advanced degree as well as possible research interests.
- Three letters from recommenders. These recommenders may be previous faculty or supervisors.
- A TOEFL/IELTS/DUOLINGO/PTE score for non-native English speakers who are required to submit an English Language test score (as per graduate school requirements)

See the Admission Criteria section of this catalog for more information.

Curricular Requirements

The Master of Science in Civil Engineering (MCV) program is offered with both a thesis option (Plan I) as well as a non-thesis option (Plan II). The designation of the selected program is not required or expected at the time of application. All MCV students on teaching or research assistantships in the department are generally expected to pursue the thesis degree option. However, the Plan-II option is also allowed for students on teaching or research assistantships. All students must complete a total of 30 credit hours to meet the MCV requirements.

Master of Science—Thesis Option (Plan I): 30 Credit Hours

Candidates for the master's degree under Plan I must earn a minimum of 24 semester hours of credit in coursework and write a thesis (a minimum of six semester hours of thesis research, CE 599, is required).

- A minimum of 24 credit hours of coursework is required. The student is required to have a minimum of 15 credit hours of CE-prefixed courses.
- A minimum of 6 credit hours of thesis research (CE 599) is required.
- The graduate advisory committee may require additional prerequisite courses for those students without an ABET or EAC-accredited degree.
- A student's thesis must be approved by the student's graduate advisory committee. The student must pass a final comprehensive examination, which is typically a presentation and defense of the thesis. A student is given a maximum of two attempts to defend their thesis successfully. In addition, the student must satisfy all university requirements defined in the current edition of the University of Alabama Graduate Catalog.

All graduate students in civil engineering are required to take "core courses" based on the student's area of study interest. All M.S. students are required to take a total of nine credits of core courses, including six credits of area-specific core classes and three credits of data science classes.

Code and Title		Hours
Core Coursework (6 credits of area specific coursework + 3 credits of Data Science coursework)		
The students must take 6 credits of area specific classes from the courses listed for specific program areas and must take 3 credits of Data Science from the Data Science Course list provided.		
Area Specific Core Coursework (6 credits required)		**6**
Architectural Engineering		
CE 566	Sustainable & Lean Constr.	
ME 516	Fnd Energy Conserv & Mgt	
ME 542	Multiscale Material Design	
ME 575	Control Systems Analysis	
Construction Engineering and Management		
CE 567	Constr. Accounting & Finance	
CE 568	Construction Scheduling	
Environmental Engineering (Water Quality)		
CE 521	Environ Eng Microbiology	
CE 522	Solid Hazardous Waste Managmnt	
CE 524	Water & Wastewater Treatment	
CE 526	Groundwater Mechanics	
CE 575	Hydrology	
Structural Engineering and Materials		
CE 531	Structural Dynamics	
CE 534	Advanced Structural Mechanics	
Transportation Systems Engineering		
CE 553	Intelligent Transportation Sys	
CE 554	Urban Transportation Planning	
CE 555	Traffic Flow Theory	
CE 558	Traffic Engineering	
Water Resources Engineering (Water Quantity)		
CE 526	Groundwater Mechanics	
CE 570	Open Channel Flow	

CE 574	Paleohydrology	
CE 575	Hydrology	
CE 576	Process Hydrology	
Data Science Coursework (3 credits required)		**3**
CE 573	Statistical Applications	
CE 515	Transportation Data Science	
CE 586	GIS for Civil Engineers	
PH 551	Machine Learning	
GY 518	Spatial and Geostats	
ST 560	Statistical Methods	
Elective Coursework		**15**
These are commonly taken elective courses. More elective options are available and can be taken with consultation/ approval of the faculty advisor.		
Construction Engineering and Management		
CE 514	Information Systems Design	
CE 517	Advanced Project Management	
CE 518	Engineering Mangement	
CE 561	Horizontal Construction Method	
CE 563	Construction Cost Estimating	
CE 564	Safety Engineering	
CE 581	Legal Asp. of Eng and Const.	
CE 562	Vertical Construction Methods	
Structural Engineering and Materials		
CE 530	NDT of Structures	
CE 532	Matrix Analysis of Structures	
CE 535	Concrete Materials	
CE 536	Wood Structural Design	
CE 537	Reinforced Concrete Struct II	
CE 538	Struct Steel Design II	
CE 543	Prestressed Concrete Design	
CE 544	Foundation Engineering	
CE 591	Special Problems	
CE 632	Structural Reliability	
Environmental and Water Resources		
CE 522	Solid Hazardous Waste Managmnt	
CE 525	Air Pollution	
CE 526	Groundwater Mechanics	
CE 529	EWR Proposal Writing	
CE 576	Process Hydrology	
CE 585	Constructn Site Erosion Contrl	
Transportation Systems Engineering		
CE 551	Roadway/Intersection Design	
CE 552	Traffic Safety and Security	
CE 553	Intelligent Transportation Sys	
CE 554	Urban Transportation Planning	
CE 555	Traffic Flow Theory	
CE 558	Traffic Engineering	
Thesis Research Requirements		**6**
CE 599	Thesis Research	
Total Hours		**30**

- Only 400-level courses without 500-level counterparts are allowed and must be approved prior to taking the class. A maximum of 6 hours of approved 400-level courses can be used for course work requirements. Students should complete Graduate School's "Approval of a 400-Level Course for Master's Credit" form.
- Students are responsible for all forms and must route all forms through the department prior to submission to UA's Graduate School.

Master of Science-Non-Thesis Option (Plan II): 30 Credit hours

Candidates for the master's degree under Plan II must earn a minimum of 30 credit hours of credit, including 27 credits of approved coursework, and complete a 3-credit class (CE 501) for the culminating experience.

- A minimum of 27 credit hours of approved coursework, including a minimum of 18 hours of CE-prefix classes.
- Students are required to take a total of nine credits of core courses, including six credits of area-specific core classes and three credits of data science classes.
- must complete a 3-credit-hour MS Capstone Project Plan-II course (CE 501).
- Culminating Experience or Capstone (CE 501): This must be taken during the graduating semester. This requires the student to develop a research paper, a policy and practice paper, or an equivalent culminating experience which is graded by the student's graduate advisor. This is taken with permission under the direction of the student's graduate advisor. The graduate advisor must be a full member of the department's graduate faculty.
- Only 400-level courses without 500-level counterparts are allowed and must be approved prior to taking the class. A maximum of 6 hours of approved 400-level courses can be used for coursework requirements. Students should complete the Graduate School's "Approval of a 400-Level Course for Master's Credit" form.

Code and Title		Hours
Core Coursework (6 credits of area specific coursework + 3 credits of Data Science coursework)		
The students must take 6 credits of area specific classes from the courses listed for specific program areas and must take 3 credits of Data Science from the Data Science Course list provided.		
Area Specific Core Coursework		**6**
Architectural Engineering		
CE 566	Sustainable & Lean Constr.	
ME 516	Fnd Energy Conserv & Mgt	
ME 542	Multiscale Material Design	
ME 575	Control Systems Analysis	
Construction Engineering and Management		
CE 567	Constr. Accounting & Finance	
CE 568	Construction Scheduling	
Environmental Engineering (Water Quality)		
CE 521	Environ Eng Microbiology	
CE 522	Solid Hazardous Waste Managmnt	
CE 524	Water & Wastewater Treatment	
CE 526	Groundwater Mechanics	
CE 575	Hydrology	
Structural Engineering and Materials		
CE 531	Structural Dynamics	

CE 534	Advanced Structural Mechanics	
Transportation Systems Engineering		
CE 553	Intelligent Transportation Sys	
CE 554	Urban Transportation Planning	
CE 555	Traffic Flow Theory	
CE 558	Traffic Engineering	
Water Resources Engineering (Water Quantity)		
CE 526	Groundwater Mechanics	
CE 570	Open Channel Flow	
CE 574	Paleohydrology	
CE 575	Hydrology	
CE 576	Process Hydrology	
Data Science Coursework (3 credits required)		**3**
CE 573	Statistical Applications	
CE 515	Transportation Data Science	
CE 586	GIS for Civil Engineers	
PH 551	Machine Learning	
GY 518	Spatial and Geostats	
ST 560	Statistical Methods	
Elective Coursework		**18**
These are commonly taken elective courses. More elective options are available and can be taken with consultation/ approval of the faculty advisor.		
Construction Engineering and Management		
CE 514	Information Systems Design	
CE 517	Advanced Project Management	
CE 518	Engineering Mangement	
CE 561	Horizontal Construction Method	
CE 563	Construction Cost Estimating	
CE 564	Safety Engineering	
CE 581	Legal Asp. of Eng and Const.	
CE 562	Vertical Construction Methods	
Structural Engineering and Materials		
CE 530	NDT of Structures	
CE 532	Matrix Analysis of Structures	
CE 535	Concrete Materials	
CE 536	Wood Structural Design	
CE 537	Reinforced Concrete Struct II	
CE 538	Struct Steel Design II	
CE 543	Prestressed Concrete Design	
CE 544	Foundation Engineering	
CE 591	Special Problems	
CE 632	Structural Reliability	
Environmental and Water Resources		
CE 522	Solid Hazardous Waste Managmnt	
CE 525	Air Pollution	
CE 526	Groundwater Mechanics	
CE 529	EWR Proposal Writing	
CE 576	Process Hydrology	
CE 585	Constructn Site Erosion Contrl	
Transportation Systems Engineering		
CE 551	Roadway/Intersection Design	
CE 552	Traffic Safety and Security	
CE 553	Intelligent Transportation Sys	
CE 554	Urban Transportation Planning	
CE 555	Traffic Flow Theory	
CE 558	Traffic Engineering	
Pnal-II Culminating Experience (Required)		**3**
CE 501	MS Capstone Proj. Plan II	
Total Hours		**30**

See the Master's Degrees Graduate School Requirements section of this catalog for additional information.

Transfer Credit

12 hours maximum of approved transfer credit. Additional information on Transfer Credit**.**

Accelerated Master's Program

AMP (BS/MS) information on the Accelerated Master's Program**.**

Time Limits for Degree Completion Requirements

Maximum of 6 years to complete all degree requirements. Graduate School information on Time Limits**.**

Student Progress Requirement

Graduate School information on Student Progress**.**

Academic Misconduct Information

Graduate School information on Academic Misconduct**.**

Withdrawals and Leave of Absence Information

Graduate School information on Withdrawals and Leave of Absence**.**

Academic Grievances Information

Graduate School information on Academic Grievances**.**

Grades and Academic Standing

Graduate School information on Grades and Academic Standing**.**

Graduate School Deadlines Information

Graduate School information on Graduate School Deadlines**.**

Application for Graduation Information

Application for Graduation**.**