



# ONLINE MS IN CIVIL ENGINEERING

BUILD THE FOUNDATION OF MODERN SOCIETY

<p><b>DELIVERY FORMAT</b> 100% Online</p>	<p><b>TIME TO COMPLETE</b> 21+ months</p>	<p><b>CREDIT HOURS</b> 30</p>
<p><b>TIME COMMITMENT</b> 15 to 20 hours weekly</p>	<p><b>START DATES</b> Fall &amp; Spring</p>	<p><b>COST</b> The MS in Civil Engineering delivers a strong return on investment, equipping you with the advanced expertise needed to thrive in today's high-demand engineering landscape. Tuition for the program is \$1,015 per credit hour, totaling \$30,450 for the full 30-credit-hour degree. Books and additional materials are not included in this estimate.</p>

## AT A GLANCE

With aging infrastructure across the United States and rapid population growth in developing regions, the demand for skilled civil engineers continues to rise. OU Online's Master of Science in Civil Engineering positions you to meet that demand—offering a flexible, fully online format that

lets you earn your degree in as few as 24 months while working full-time. Advance your expertise in one of the most vital and fast-growing fields in engineering.

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## WHAT CAN I DO WITH A CIVIL ENGINEERING MASTER'S DEGREE

As civil engineering projects grow more complex—with increasing demands for safety, sustainability, durability, and cost efficiency—the need for advanced expertise has never been greater. The online MS in Civil Engineering prepares you to lead in this evolving landscape and advance your career in areas such as:

- Civil Engineer
- Construction Engineer
- Building Control Officer
- Water Resource Engineer
- Building Services Engineer
- Quantity Surveyor
- Engineering Geologist

## INDUSTRY INSIGHTS

- Median Pay: \$99,590
- Job Outlook: Employment for civil engineers is expected to grow 6% by 2033
- Job Openings: 22,900 openings for civil engineers are projected each year, on average, over the next decade

*Source: U.S. Bureau of Labor Statistics*

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## PROGRAM OUTCOMES: WHAT YOU'LL LEARN

By choosing a concentration in Geotechnical, Structural, Transportation, or Water Resources Engineering, you will gain the specialized skills needed to lead in a rapidly growing industry. Each concentration offers the opportunity to earn professional development credit, which may count toward professional licensure—helping you advance your credentials and career simultaneously.

### GEOTECHNICAL ENGINEERING CONCENTRATION

The Geotechnical Engineering concentration allows you to build the skills you need to ensure the safety and stability of structures from the ground up.

- Develop advanced design and analysis skills for foundation and environment considerations or change specialties
- Deep dive into geologic media, soil–structure interactions, runoff and pollutants, and foundation construction principles
- Apply critical equations, analytical methods, and industry–standard software tools to solve real–world problems

## **STRUCTURAL ENGINEERING CONCENTRATION**

The Structural Engineering concentration can advance your practical design skills and equip you for analytical or experimental research.

- Deep dive into properties, fabrication methods, and wood, steel, and concrete applications
- Learn critical equations and analysis methods for determining the safety and soundness of structures
- Pursue structural engineering at an advanced level or as a new specialty

## **TRANSPORTATION ENGINEERING CONCENTRATION**

The Transportation Engineering concentration explores the impetus, philosophy, and policy for implementing a long–term, comprehensive plan for managing infrastructure assets.

- Understand the planning, financing, functional design, and management of facilities for any mode of transportation to provide for the safe and efficient movement of people and goods
- Deep dive into engineering and economic analysis concepts and processes to evaluate and support a transportation system’s strategic and systematic investment, performance, and management

## **WATER RESOURCES ENGINEERING CONCENTRATION**

The Water Resources Engineering concentration will teach you to create a more sustainable infrastructure by developing new equipment and systems for water management facilities to ensure that citizens are provided with a continuous supply of uncontaminated water.

- Advance your practical skills in water resources and contribute to global impact with one of the world’s most valued natural resources
- Deep dive into water resources planning and management, engineering hydrology, watershed science or water reuse, and groundwater structure

**TO APPLY: [HTTPS://ONLINE.OU.EDU/ADMISSIONS/GRADUATE/](https://online.ou.edu/admissions/graduate/)**

**FOR MORE INFO: [HTTPS://ONLINE.OU.EDU/PROGRAM/MS-IN-CIVIL-ENGINEERING/](https://online.ou.edu/program/ms-in-civil-engineering/)**

## COURSE DETAILS

The curriculum delivers advanced technical and analytical training in civil engineering, with specialized coursework tailored to your chosen concentration. Each course equips you with practical, real-world skills that align with industry demands and position you for long-term success.

## COURSE STRUCTURE

You'll earn 30 credit hours across 10 courses, taking three core courses and 7 to 8 specialization courses depending on your track. Courses are a mix of synchronous and asynchronous coursework. Live lectures are required each week, but missed lectures can be made up.

### CORE COURSES

#### **Fundamentals of Project Management**

*Credit Hours: 3*

Foundational survey course that considers both technical and sociocultural aspects of project management across the full project life cycle.

#### **Advanced Mechanics of Materials**

*Credit Hours: 3*

Principal stresses and strains; theories of failure; introduction to elasticity; unsymmetrical bending and shear; torsion of noncircular solid cross sections, cellular sections and open sections; introduction to plate bending and buckling.

#### **Leadership and Management for Engineers**

*Credit Hours: 3*

This course will help prepare students for leadership and management positions in a global culture. The course emphasizes team building attributes in a multicultural organization, how to build commitment among team members, and how to organize to compete in the global marketplace. Students will gain a better understanding of themselves and their personal and professional goals.

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## **GEOTECHNICAL ENGINEERING CONCENTRATION**

### **Foundation Engineering**

*Credit Hours: 3*

Substructure analysis and design to meet various soil conditions; footings and rafts, shoring and underpinning, piles, cofferdams, caissons, breakwaters, piers, wharves, vibratory effects on foundations.

### **Unsaturated Soil Mechanics**

*Credit Hours: 3*

Provide students with an understanding of the theoretical and practical fundamentals of unsaturated soil mechanics with applications in geotechnical engineering.

### **Introduction to Soil Dynamics**

*Credit Hours: 3*

Review of basic concepts (single- and multi-degree of freedom system, wave propagation, behavior of dynamically loaded soils), liquefaction, vibrations of footings on elastic half space, analog models, dynamics of pile foundations, machine foundations, design of foundations for dynamic loads including earthquake loading.

### **Structural Design of Pavements**

*Credit Hours: 3*

Effect of load and climate on the design of rigid and flexible pavements and interaction of pavement components.

### **Geosynthetics**

*Credit Hours: 3*

To introduce students to concepts and design methods involving the use of geosynthetics in geotechnical and transportation engineering applications.

### **Soil-Structure Interaction**

*Credit Hours: 3*

Introduction—definition, methods of solution; beams on deformable foundations; analysis and design of axially loaded structures — single pile, pile groups, retaining walls; plates on deformable foundations; role of interfaces and joints; wave equation for pile behavior.

### **Advanced Soil Mechanics**

*Credit Hours: 3*

Advanced treatment of theories and principles of shearing strength, stress distribution and settlement analysis.

### **Capstone Design Experience**

*Credit Hours: 3*

An independent capstone design experience that focuses on a real-world, open-ended design problem that applies the skills, knowledge, and techniques learned by the student during their graduate studies.

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## **STRUCTURAL ENGINEERING CONCENTRATION**

### **Foundation Engineering**

*Credit Hours: 3*

Substructure analysis and design to meet various soil conditions; footings and rafts, shoring and underpinning, piles, cofferdams, caissons, breakwaters, piers, wharves, vibratory effects on foundations.

### **Design of Prestressed Concrete Structures**

*Credit Hours: 3*

Design procedures for pretensioned and post-tensioned concrete structures, with emphasis on the behavior of prestressed concrete. Topics include methods of analysis, time dependent effects, fabrication and construction procedures, connections, highway bridges, frames, composite construction, continuous structures, and anchorage zone detailing.

### **Structural Design - Wood**

*Credit Hours: 3*

Material properties and behavior of wood. Analysis and design of solid and laminated structural members, connections, systems, trusses and arches. Current developments in structural wood design and research.

### **Structural Design - Concrete II**

*Credit Hours: 3*

Advanced reinforced concrete behavior and design including limit design, anchorage slender columns, truss models for shear and torsion on beams, two-way and flat slabs, and the art of detailing.

### **Structural Design - Steel II**

*Credit Hours: 3*

Advanced structural steel design including steel deck diaphragms, column and beam bracing, composite beam design, rigid frame design, torsional member design, plate girder design, and design of building connections.

### **Soil-Structure Interaction**

*Credit Hours: 3*

Introduction—definition, methods of solution; beams on deformable foundations; analysis and design of axially loaded structures -- single pile, pile groups, retaining walls; plates on deformable foundations; role of interfaces and joints; wave equation for pile behavior.

### **Dynamics of Structures**

*Credit Hours: 3*

Free vibration, forced vibration, and transient response of structures having one, multiple, or infinite number of degrees-of-freedom; structural damping effects; numerical solution techniques; Lagrange's equation of motion; Rayleigh-Ritz method. General matrix formulation for multiple degrees-of-freedom and modal coordinate transformation. Introduction to earthquake engineering concepts.

## **TRANSPORTATION ENGINEERING CONCENTRATION**

### **Fundamentals of Geographic Information Systems**

*Credit Hours: 3*

Designed to help students learn introductory to intermediate concepts of geographic information science (GIScience) and become proficient users of geographic information systems (GIS). The course covers a variety of topics but focuses on GIS data models, data structures, and spatial analysis.

### **Transportation Asset Management, Planning, and Finance**

*Credit Hours: 3*

This course will focus on fundamental elements of transportation asset management and application of its principles in practice. It will explore the impetus, philosophy and policy for implementing a long term, comprehensive plan for managing infrastructure assets. It will present engineering and economic analysis concepts and processes used to evaluate and support strategic and systematic planning, finance, investment, performance, measurement, management and preservation of a transportation system.

### **Highway Engineering**

*Credit Hours: 3*

In this course, students will study geometric elements of highway design, with emphasis on highway safety and traffic flow, design controls, route analysis, and alignment. Highway engineering includes corridor selection, design of vertical and horizontal alignments, evaluation of earthwork requirements, drainage and culvert design, and safety considerations.

### **Structural Design of Pavements**

*Credit Hours: 3*

Effect of load and climate on the design of rigid and flexible pavements and interaction of pavement components.

### **Fundamentals of Engineering Statistical Analysis**

*Credit Hours: 3*

Introduction to probability, expectation, discrete and continuous distributions, sampling and descriptive statistics, parameter estimation, and statistical tests to aid decision making. The student will learn analysis techniques for verification of systems parameters.

### **Traffic Engineering**

*Credit Hours: 3*

This course focuses on traffic flow theory, analysis of traffic data, and advanced technology applications for data collection, traffic control, and real-time system management. It will include emphasis on highway capacity, signal integration, intelligent transportation systems (ITS), and impacts of advanced technology, including automated vehicles.

### **Multimodal Transportation**

*Credit Hours: 3*

This course focuses on fundamental elements of system performance for the multimodal transportation system and application of its principles; explores the impetus, philosophy, and policy for implementing a long term, comprehensive plan; presents transportation modes, including land, air and marine, modal shift and impact; presents engineering/economic analysis concepts used to evaluate and support planning, design, and financing processes for multimodal system.

## **WATER RESOURCES ENGINEERING CONCENTRATION**

### **Groundwater and Seepage**

*Credit Hours: 3*

An applied course dealing with properties of aquifers, modeling of groundwater flow, groundwater hydrology and its interrelation with surface water, well hydraulics, pumping tests and safe yield of aquifers.

### **Fundamentals of Geographic Information Systems**

*Credit Hours: 3*

Designed to help students learn introductory to intermediate concepts of geographic information science (GIScience) and become proficient users of geographic information systems (GIS). The course covers a variety of topics but focuses on GIS data models, data structures, and spatial analysis.

### **Hydrometeorology**

*Credit Hours: 3*

Hydrometeorology is part of meteorology directly concerned with hydrologic problems, such as forecasting and observing heavy precipitation and floods and how such features impact flood control, hydroelectric power, irrigation and similar fields of engineering and water resource management.

### **Water Law**

*Credit Hours: 3*

A course for non-lawyers that explores systems of water rights; riparian, appropriation, and prescriptive rights; stream, surface, and ground water; development of water supplies; nationwide conflicts; water pollution control; federal and Indian rights and federal water resource issues and problems, so that water managers, environmental scientists or policy makers can provide needed input to threats to and protection of water.

### **Open Channel Flow**

*Credit Hours: 3*

Theory, analysis and design of channels, aqueducts, headworks, siphons, spillways and hydraulic structures. An in-depth study of critical flow and measurement techniques. Backwater analysis by analytical, calculator and computer methods. Special emphasis on practical problems of general interest, such as channel design and floodplain analysis with HEC-RAS.

### **Water Security**

*Credit Hours: 3*

This course defines water security as existing at the water quantity-quality-equity nexus, looks at historical examples of water insecurity, discusses major water security challenges (e.g., natural disasters, global warming, the water-food-energy nexus, urbanization, transboundary issues) as well as responses to these challenges (e.g., water resilience plans, LID, desalination/reuse technologies, developing a water ethic) and evaluates pioneering water security initiatives.

### **Water Resources Systems Modeling**

*Credit Hours: 3*

Theory and concept of water resources management. An in-depth study of theory of optimization, hydrologic modeling, reservoir and dams operation. Data analysis and computational methods for hydrology and water resources management. Special emphasis on system modeling and parameter tuning using automatic calibration approaches. Basic level of scientific programming.

### **Hydrology**

*Credit Hours: 3*

Hydrology is the study of water across the globe. This is an applied course on hydrology dealing with environmental water problems; principles of hydrologic systems, their structure and components; and methods of analysis and their application to various purposes of water resources planning and development.

### **Water Treatment, Reuse and Health Impacts**

*Credit Hours: 3*

An introduction to water quality applications and the health impacts of water and wastewater. The

course covers the basic principles of public health epidemiology and water-related diseases. Conventional and advanced water treatment methods are presented, along with various types of potable and non-potable water reuse to supplement public water supply in times of water stress.

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## WHY CHOOSE OU ONLINE FOR AN MS IN CIVIL ENGINEERING

OU Online is a top-tier public institution offering high-quality, affordable undergraduate and graduate programs in a flexible, fully online format designed for working professionals.

### FACULTY EXPERTISE

Learn from nationally recognized educators and researchers, including recipients of nine NSF CAREER awards—one of the most prestigious honors for early-career faculty. In addition to their academic achievements, CEES faculty bring more than 180 years of combined industry experience into the classroom, enriching your learning with real-world insights and practical applications.

### ROBUST STUDENT SUPPORT

OU Online provides comprehensive student support services to help you succeed at every stage of your academic journey. Access academic advising, online tutoring, mental health counseling, and career development resources tailored to your goals. The civil engineering master's program is designed to fit your schedule, allowing you to advance your education while maintaining full-time employment.

### GLOBAL ALUMNI NETWORK

Join a global network of more than 250,000 OU alumni. As a Sooner, you'll gain access to a powerful community of civil engineering professionals and industry leaders who can help you grow your career and expand your opportunities.

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## COST & FINANCIAL AID

Earning your Master of Science in Civil Engineering is a powerful investment in your future—and OU Online is committed to making that investment clear, accessible, and worthwhile.

Tuition for the program is \$1,015 per credit hour, bringing the total cost to \$30,450 for the 30-credit-hour degree. Please note that books and additional materials are not included in this estimate.

Financial aid, scholarships, and employer tuition assistance may be available to help reduce your out-of-pocket costs. For personalized support, contact the Online Aid office at [onlineaid@ou.edu](mailto:onlineaid@ou.edu) or call 405-325-2929.

A nonrefundable deposit of \$350 is required upon admission to secure your place in the program. This deposit guarantees your spot in your first semester of courses and will be applied toward your first semester's tuition.

*\* Please be aware that tuition and fees may change, as determined by the Oklahoma State Regents for Higher Education.*

## TRANSFER CREDIT

You can transfer up to 12 credit hours of graduate-level coursework per Graduate College policy and with approval of the department. This credit cannot have been previously applied to any completed degree and cannot be older than 5 years. You must provide a syllabus for each course.

**LEARN MORE ABOUT FINANCIAL AID: [HTTPS://ONLINE.OU.EDU/COST-AND-AID/GRADUATE/](https://online.ou.edu/cost-and-aid/graduate/)**

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## TAKE THE NEXT STEP

Admission to the online M.S. in Civil Engineering program is selective. Those interested in the program should have earned a bachelor's degree in Civil Engineering or a closely related discipline from an accredited university with a competitive undergraduate GPA.

- Applicants with unrelated conferred degrees who have completed the prerequisites for this chosen track MAY still be considered for admission.
- Candidates who require more than three prerequisite courses are encouraged to discuss options with their Enrollment Coach before applying.

The admissions committee also considers additional factors such as professional or service experience, leadership potential, unique talents or skills, and evidence of academic growth over time.

## APPLICATION PROCESS

- Complete the online application at <https://gograd.ou.edu/apply/>
- Submit a current resume or CV
- Provide official college transcripts from all institutions
- Submit a personal statement

Foreign applicants may be required to submit scores from the Test of English as a Foreign Language (TOEFL) to demonstrate proficiency in English sufficient to complete the program successfully.

## APPLICATION TIMELINE

The admissions committee reviews applications on a rolling basis. Admissions may remain open until two weeks before the start of classes, so early application is encouraged.

A nonrefundable deposit of \$350 is required upon admission to secure your place in the program. This deposit guarantees your spot in your first semester of courses and will be applied toward your first semester's tuition.

**STEP 1**

Contact an Enrollment Coach to discuss your qualifications and interest in the program.

**STEP 2**

Complete the online application at <https://gograd.ou.edu/apply/>

**STEP 3**

Provide supplemental materials, including a resume, official college transcripts, and a personal statement.

**TO APPLY: [HTTPS://GOGRAD.OU.EDU/APPLY/](https://gograd.ou.edu/apply/)**