CIVIL ENGINEERING (CIVE)

CIVE 3010 Introduction to Transportation Engineering
Fall
* Prerequisite(s): EGDT 1040, University Advanced Standing and (Formal Acceptance into the Civil Engineering Program or Departmental Approval)
Focuses on the analysis of transportation systems and their components. Introduces technological, economic, and social aspects of transportation. Covers economic considerations, role of public policy, system planning, design, management, traffic flow models, intersection control, network analysis, and environmental impact.

CIVE 3130 Structural Analysis
Fall
* Prerequisite(s): ENGR 2140, University Advanced Standing, and (Formal Acceptance into the Civil Engineering Program or Departmental Approval)
Focuses on analysis of determinate and indeterminate structural systems. Covers flexibility and moment distribution methods. Introduces design load distribution and load guidelines.

CIVE 3140 Structural Steel Design
Spring
* Prerequisite(s): CIVE 3130, University Advanced Standing, and (Formal Acceptance into the Civil Engineering Program or Departmental Approval)
Focuses on design of structural steel components of a building. Covers tension members, compression members, beams, and connections using Load and Resistance Factor Design (LRFD). Includes a design component.

CIVE 3150 Reinforced Concrete Design
Spring
* Prerequisite(s): CIVE 3130, University Advanced Standing, and (Formal Acceptance into the Civil Engineering Program or Departmental Approval)
Focuses on design of reinforced concrete components of a structure. Covers beams, columns, slabs, and foundations according to the American Concrete Institute (ACI) 318 building code requirements. Includes a design component.

CIVE 3210 Geotechnical Engineering
Spring
* Prerequisite(s): ENGR 2140, University Advanced Standing, and (Formal Acceptance into the Civil Engineering Program or Departmental Approval)
Focuses on the study of soil properties, classifications, and behavior. Applies principles of mechanics to soil as an engineering material. Introduces consolidation and compaction theories, effective stresses, shear strength, and earth pressure and slope stability. Includes a design component.

CIVE 3320 Hydraulics and Hydrology
Spring
* Prerequisite(s): ENGR 2450, ME 3310, University Advanced Standing, and (Formal Acceptance into the Civil Engineering Program or Departmental Approval)
Focuses on concepts of hydraulics such as pipe and open channel flows. Covers weather patterns, precipitation measurement, distribution, and runoff. Introduces storm hydrograph and peak flow analysis, flood design, reservoir and channel routing. Includes a design component.

CIVE 3335 Civil Engineering Experimentation I
Spring
* Prerequisite(s): ME 3310, University Advanced Standing, and (Formal Acceptance into the Civil Engineering Program or Departmental Approval)
Focuses on testing of civil engineering materials such as soil, asphalt, concrete, and metals related to geotechnical, pavement, and structural aspects of civil engineering. This is a laboratory course with a writing component.

CIVE 3336 Civil Engineering Experimentation II
Fall
* Prerequisite(s): CIVE 3210 and University Advanced Standing
Covers classification of highways. Focuses on testing of civil engineering materials such as soil, asphalt, concrete, and metals related to geotechnical, pavement, and structural aspects of civil engineering. This is a laboratory course with a writing component.

CIVE 4010 Traffic Engineering
Fall
* Prerequisite(s): CIVE 3010 and University Advanced Standing
Introduces elements of traffic engineering including: road use, traffic flow theories, traffic control devices, traffic data collection. Covers freeways and rural highways and principles of intersecting signalization, service level and capacity. Includes a design component.

CIVE 4020 Highway Planning and Design
Spring
* Prerequisite(s): CIVE 3010 and University Advanced Standing
Covers classification of highways. Focuses on the process involved in design of highways and their elements. Introduces design of highway cross sections, intersections, and interchanges. Covers design of vertical and horizontal alignment and establishment of sight distances. Includes a design component.

CIVE 4315 Civil Engineering Experimentation II
Fall
* Prerequisite(s): CIVE 3210 and University Advanced Standing
Covers classification of highways. Focuses on testing of civil engineering materials such as soil, asphalt, concrete, and metals related to geotechnical, pavement, and structural aspects of civil engineering. This is a laboratory course with a writing component.

CIVE 4335 Foundation Design
Fall
* Prerequisite(s): CIVE 3210 and University Advanced Standing
Covers foundation classifications. Applies fundamentals of soil mechanics to analysis and design of soil structure systems. Covers shallow and deep foundations, piles and caissons, and retaining structures. Includes a design component.

CIVE 4336 Storm Water Management
Spring
* Prerequisite(s): ME 3310 and University Advanced Standing
Applies fluid mechanics and hydrology principles to the analysis and design of storm water management facilities. Covers environmental issues related to storm water management. Includes a design component.

CIVE 4337 Open Channel Flow
Fall
* Prerequisite(s): CIVE 3320 and University Advanced Standing
Covers analysis of open channel flow systems. Introduces natural and designed channels, steady and unsteady flows, uniform and non-uniform flows and flow transitions. Includes lectures and design projects.
### CIVE 4510
**Civil Engineering Seminar**  
1:1:0  
Fall  
* Prerequisite(s): University Advanced Standing  
* Prerequisite(s) or Corequisite(s): CIVE 4810  
Introduces various civil engineering careers and related industries. Emphasizes the importance of life-long learning and active participation in professional societies and communities through lectures given by practicing engineers using their own experiences. Introduces various engineering codes of ethics. Intended as a culminating seminar for graduating seniors to prepare for their engineering careers.

### CIVE 4610
**Water and Wastewater**  
3:3:0  
Spring  
* Prerequisite(s): CIVE 3320 and University Advanced Standing  
Introduces municipal water and wastewater treatment and distribution practices. Applies physical, chemical, and biological principles to design and operation of water and wastewater distribution systems.

### CIVE 4810
**Civil Engineering Capstone I**  
3:3:0  
Fall  
* Prerequisite(s): University Advanced Standing, Formal Acceptance into Civil Engineering Program, and Department Approval  
Serves as a comprehensive two-semester civil engineering design experience with practical constraints. Focuses on applying civil engineering principles and the design process along with economic analysis and project management methods to a real-world project, and present the findings to other engineers and the public. Capstone I and II must be taken in consecutive semesters.

### CIVE 4820
**Civil Engineering Capstone II**  
3:3:0  
Spring  
* Prerequisite(s): CIVE 4810 and University Advanced Standing  
Serves as a second semester of the two-semester design experience from conception to modeling or prototype. Focuses on applying civil engineering principles and the design process along with economic analysis and project management methods to a real-world project, and present the findings to other engineers and the public. Capstone I and II must be taken in consecutive semesters.

### CIVE 490R
**Advanced Current Topics in Civil Engineering**  
1 to 3:1:0  
Fall, Spring  
* Prerequisite(s): University Advanced Standing and (Formal Acceptance into the Civil Engineering Program or Department Approval)  
Provides exposure to emerging topics and technologies of current interest in civil engineering. Varies each semester depending upon the state of technology. May be repeated for a maximum of 6 credits toward graduation without prior written department approval.