CIV
Civil Engineering

CIV 100: Infrastructure
This course explores the science and engineering of the built environment and the important role of infrastructure in daily life. Students will learn about major infrastructure systems including transportation, water resources, environmental, energy, and structural infrastructure.
3 credits

CIV 210: Land Surveying
Introduces the general mathematical and physical concepts related to engineering surveying. Covers plane surveying, geodesy, geodetic, measurement techniques and instruments, leveling, error theory, survey adjustments, coordinate systems and datums. Practical measurement techniques and instruments, and survey staking. Introduces photogrammetry and remote sensing, geographic information systems (GIS).
Prerequisites: PHY 127 or 132; MAT 127 or 132 or 142 or AMS 161; CIV major
1 credit

CIV 300: Technical Communication
Aims to ensure proficiency in the types of communication necessary for success in the engineering professions. Provides students with the ability to apply their knowledge of correct written and spoken English to the diverse modes of communication encountered and used by engineers in the professional workplace. Combined with laboratory courses to create practical application of writing skills to civil engineering laboratory reports.
Prerequisites: WRT 102 and CIV major
Corequisite: CIV 340
1 credit, S/U grading

CIV 305: Transportation Systems Analysis I
Focused on highway transportation planning and traffic analysis. Topics include transportation planning, performance analysis of highway and road design, highway segments, highway and airport pavement design, geometric design, sight elevations and alignment, highway traffic operations, queuing theory and modeling, traffic analysis and control, travel demand models, ethics, sustainability, and environmental considerations during transportation planning.
Prerequisites: AMS 361 or MAT 303; CIV major
3 credits

CIV 306: Transportation Systems Analysis II
Focus is on high-speed ground transportation, urban transit and advanced modeling. Transportation and systems modeling. Planning, modeling and design of high-speed transit systems. Urban travel demand modeling. Transportation network modeling, uncongested and congested network models, planning and design issues of urban transit design. Highway asset management. Environmental transportation models, sustainability. Transportation system comparisons and evaluation, benefit and revenue cost analysis, and multi-criteria analysis.
Prerequisite: CIV 305
3 credits

CIV 310: Structural Engineering
Prerequisites: MEC 363; CIV major
3 credits

CIV 312: Design of Civil Engineering Structures
Prerequisite: CIV 310
3 credits

CIV 320: Water Supply and Waste Management
Prerequisites: MEC 364; CME 304; CIV major
3 credits

CIV 330: Soil Mechanics
Prerequisite: CIV 310
3 credits

CIV 340: Civil Engineering Materials Laboratory
Laboratory experiments that illustrate the basic analysis and behavior of civil engineering materials and structures. Mechanical loading and analysis of steel, wood, and concrete; quality control tests and field testing; testing of concrete structures. Lab report writing, measurement analysis, and error propagation theory.
Prerequisite: MEC 363
Corequisite: CIV 310
2 credits

CIV 341: Geotechnical Engineering Laboratory
Laboratory experiments that illustrate the basic analysis and behavior of soils, including liquid and plastic limits, grain size, compaction, permeability, consolidation, compression and shear strength. Lab report writing, measurement and error analysis.
Prerequisite: MEC 363
Corequisite: CIV 330
2 credits

CIV 342: Water Resources and Environmental Engineering Laboratory
Laboratory experiments that illustrate the fundamentals of hydraulics with application to water resources and physical, chemical, and biological treatment techniques for purification of water. Lab report writing, measurement and error analysis.
CIV 410: Principles of Foundation Engineering
Prerequisites: CIV 312 and CIV 330
3 credits

CIV 420: Hydraulics
Prerequisites: MEC 364 and CIV major
3 credits

CIV 440: Senior Design I
Students will participate in structured engineering projects under supervision. They will be assigned to carry out significant professional responsibilities and whatever additional assignments are determined by their advisors. Assignments will cover in-situ data management and testing, specific limits, engineering judgments and reporting.
Prerequisites: CIV 305 and 312 and 320 and 330 and 340
3 credits

CIV 441: Senior Design II
Students will participate in structured engineering projects under supervision. They will be assigned to carry out significant professional responsibilities and whatever additional assignments are determined by their advisors. Assignments will design of civil engineering structures, design of special structures, comprehensive and realistic design project using the systems approach, design choices and their effect upon the environment, design constraints including constructability, minimization of environmental impact, and cost-effectiveness, managerial and professional aspects of design practice.
Prerequisite: CIV 440
3 credits