ENGINEERING: CIVIL ENGINEERING (ENGV)

ENGV 205 Computer Aided Design 1,3 Credit Hour(s)
Resident Prerequisite: ENGR 110
Online Prerequisite: ENGR 110 or ENGR 115
This course provides students to an introduction to computer aided graphics, drafting and design, and how it is applied in civil engineering.
Offered: Residential and Online

ENGV 225 Surveying 2-3 Credit Hour(s)
Prerequisite: ENGV 205
This course provides students to an introduction to surveying, with an emphasis on the identification and minimization of errors found in surveying work. Surveying represents the art, science and technology of determining the relative positions of points above, on, or beneath the Earth's surface. The student will learn how to measure distances, angles, areas, horizontal and vertical curves, and volumes.
Offered: Residential and Online

ENGV 250 Strength of Materials 3 Credit Hour(s)
Prerequisite: ENGR 235
This course provides the students' second exposure to structural analysis. Following statics, this course presents basic concepts in structural analysis: stress, strain, torsion, bending, shear, and deflection.
Offered: Online

ENGV 320 Civil Engineering Lab 2 Credit Hour(s)
Resident Prerequisite: ENGV 225 and ENGV 336 (may be taken concurrently) and ENGV 410 (may be taken concurrently)
Online Prerequisite: ENGV 225 and (ENGV 336 or ENGV 425) and ENGV 410
This course presents civil engineering students with various types of laboratory work within the civil engineering profession. This course provides civil engineering students with laboratory experience in transportation, asphalt materials, and surveying. Students will perform transportation laboratory exercises, conduct surveying field work, and assess material properties and strengths of asphalt materials. Students will perform laboratory work in teams and prepare written reports of their results.
Offered: Residential and Online

ENGV 325 Structural Analysis 3 Credit Hour(s)
Prerequisite: ENGR 330
This course provides the students' third exposure to structural analysis. Following strength of materials, this course presents basic concepts in structural analysis: loads and analysis (including deflection) of statically determinate structures (trusses, beams, and frames) and indeterminate structures (using slope-deflection and moment-distribution methods).
Offered: Residential and Online

ENGV 336 Civil Engineering Materials 3 Credit Hour(s)
Resident Prerequisite: CHEM 121 and PHYS 231
Online Prerequisite: CHEM 115 and PHYS 231
This course provides the students with an overview of different types of materials used for civil engineering, such as steel, aluminum, aggregates, cement, asphalt, masonry, wood, and composites. Students will develop a foundational understanding of the properties, manufacturing processes, and applications of various materials for civil engineering. Emphasis is placed on the understanding of how these materials are produced, tested, and utilized in various civil engineering applications, including materials selection and design.
Offered: Residential and Online

ENGV 345 Soil Mechanics 3 Credit Hour(s)
Prerequisite: ENGR 330
This course provides the students' initial and foundation course in geotechnical engineering. Following mechanics of materials, this course applies principles of mechanics to soil as an engineering material and presents the study of soil properties and classification, compaction and consolidation theories, in-situ stresses under hydrostatic, one-dimensional, and two-dimensional seepage conditions, and shear strength.
Offered: Residential and Online

ENGV 355 Civil Engineering Lab II 2 Credit Hour(s)
Resident Prerequisite: ENGV 345 and ENGV 365 (may be taken concurrently) and ENGV 400 (may be taken concurrently)
Online Prerequisite: ENGV 345 and ENGV 365 and (ENGV 390 or ENGV 400)
This course presents civil engineering students with various types of laboratory work within the civil engineering profession. This course provides civil engineering students with laboratory experience in soils, steel, concrete, and hydraulics. Students will perform laboratory work to assess material properties and strengths of several civil engineering materials (e.g., soils, steel, and concrete), and conduct laboratory work in hydraulics. Students will perform laboratory work in teams and prepare written reports of their results.
Offered: Residential and Online

ENGV 365 Hydraulic Engineering 3 Credit Hour(s)
Prerequisite: ENGR 315
This course provides the students' initial and foundation course in hydraulics and hydrology. Following fluid dynamics, this course presents basic concepts in water pressure, pipe flow, pipe networks, pumps, open channel flow, groundwater flow, hydraulic structures, and hydrology.
Offered: Residential and Online

ENGV 380 Project and Construction Management 3 Credit Hour(s)
Prerequisite: ENGI 220
This course provides the student with a comprehensive introductory course in project and construction management. The course presents an overview of the construction industry, then topics in project delivery methods, scheduling techniques, construction estimating, contract documents, equipment selection, building materials & construction methods, productivity, and safety.
Offered: Residential and Online

ENGV 390 Steel Structure Design 3 Credit Hour(s)
Prerequisite: ENGV 325
This course provides the students one of two design application courses in structures. Following structural analysis, this course presents the steel design concepts of tension and compression members, beams and beam-columns, connections, composite construction, and plate girders.
Offered: Residential and Online

ENGV 395 Geotechnical Engineering 3 Credit Hour(s)
Prerequisite: ENGV 345
This course is designed to prepare students for geotechnical engineering practice by introducing the fundamental concepts involved in subsurface investigations, stresses in soils, geotechnical design of shallow foundations, deep foundations and retaining structures, and stability of excavations and slopes.
Offered: Residential and Online

ENGV 400 Structural Design 3 Credit Hour(s)
Prerequisite: ENGV 325
This course provides the students design application in structures using concrete and steel materials. Following structural analysis, this course presents the steel design concepts of tension and compression members, beams and beam-columns, connections, composite construction, and plate girders. Also, the design principles of reinforced concrete (RC) structures are presented focusing on the limit states design approach. The design of specific RC structural members such as beams, columns, and slabs subject to bending, shear, and combined bending and axial loads is also discussed.
Offered: Residential and Online

ENGV 410 Transportation Engineering 3 Credit Hour(s)
Prerequisite: ENGV 205
This course provides the student with a comprehensive introductory course in transportation engineering. This course presents the concepts of traffic flow, traffic safety, traffic operations, traffic capacity, and transportation planning.
Offered: Residential and Online

ENGV 415 Special Topics in Construction Engineering 3 Credit Hour(s)
Prerequisite: ENGI 220
This course provides presents additional and / or current studies in the area of construction engineering, and serves as a technical elective for the student.
Offered: Residential and Online

ENGV 420 Professional Practice 2-3 Credit Hour(s)
Resident Prerequisite: BIOL 101 and CHEM 121 and ENGI 220
Online Prerequisite: BIOL 101 and CHEM 115 and ENGI 220
This course provides the student with a comprehensive overview of multiple professional issues: contracts and contract law; professional liability; ethics; licensure; sustainability and sustainable design; public policy; and management skills. Following Engineering Design Introduction, this senior-level course presents the non-technical aspects of the engineering profession.
Offered: Residential and Online

ENGV 425 Concrete Structure Design 3 Credit Hour(s)
Prerequisite: ENGV 325
This course provides the students the second of two design application courses in structures. Following structural analysis, this course presents the concrete design concepts of beams, columns, slabs, walls, and footings.
Offered: Residential and Online

ENGV 435 Highway Engineering 3 Credit Hour(s)
Prerequisite: ENGV 225 and ENGV 336
This course provides the students with understanding of the design, construction, and maintenance of highways. This course is designed to equip students with fundamental knowledge on the principles and techniques essential for highway engineering with a specific focus on geometric design, pavement design, and highway construction and maintenance. Students will explore the theoretical and practical aspects of designing road alignments, cross-sections, and other related elements of highways. The students will also gain knowledge about the methodologies of pavement design, understanding various road materials, load distributions, and environmental factors.
Offered: Residential and Online

ENGV 440 Special Topics in Structural Engineering 3 Credit Hour(s)
Prerequisite: ENGV 325
This course provides presents additional and / or current studies in the area of structural engineering, and serves as a technical elective for the student.
Offered: Residential and Online

ENGV 455 Special Topics in Geotechnical Engineering 3 Credit Hour(s)
Prerequisite: ENGV 345
This course provides presents additional and / or current studies in the area of geotechnical engineering, and serves as a technical elective for the student.
Offered: Residential and Online

ENGV 460 Special Topics in Transportation Engineering 3 Credit Hour(s)
Prerequisite: ENGV 410
This course provides presents additional and / or current studies in the area of transportation engineering, and serves as a technical elective for the student.
Offered: Residential and Online

ENGV 481 Civil Engineering Design I 3 Credit Hour(s)
Resident Prerequisite: ((ENGV 325 and ENGV 336 and ENGV 345) or (ENGV 325 and ENGV 336 and ENGV 365) or (ENGV 325 and ENGV 336 and ENGV 380) or (ENGV 325 and ENGV 336 and ENGV 410) or (ENGV 325 and ENGV 345 and ENGV 365) or (ENGV 325 and ENGV 345 and ENGV 380) or (ENGV 325 and ENGV 345 and ENGV 410) or (ENGV 325 and ENGV 365 and ENGV 380) or (ENGV 325 and ENGV 365 and ENGV 410) or (ENGV 325 and ENGV 380 and ENGV 410) or (ENGV 336 and ENGV 345 and ENGV 365) or (ENGV 336 and ENGV 345 and ENGV 380) or (ENGV 336 and ENGV 345 and ENGV 410) or (ENGV 336 and ENGV 365 and ENGV 380) or (ENGV 336 and ENGV 365 and ENGV 410) or (ENGV 336 and ENGV 380 and ENGV 410) or (ENGV 345 and ENGV 365 and ENGV 380) or (ENGV 345 and ENGV 365 and ENGV 410) or (ENGV 345 and ENGV 380 and ENGV 410) or (ENGV 365 and ENGV 380 and ENGV 410) and (MATH 234 or MATH 334)) and ENGI 220 and ENGR 210 and ENGR 235 and ENGR 240 and ENGR 270 and ENGR 315 and ENGR 330 and ENGV 225 and MATH 131 and MATH 132 and MATH 231 and PHYS 231
Online Prerequisite: ((ENGV 325 and ENGV 336 and ENGV 345) or (ENGV 325 and ENGV 336 and ENGV 365) or (ENGV 325 and ENGV 336 and ENGV 380) or (ENGV 325 and ENGV 336 and ENGV 410) or (ENGV 325 and ENGV 345 and ENGV 365) or (ENGV 325 and ENGV 345 and ENGV 380) or (ENGV 325 and ENGV 345 and ENGV 410) or (ENGV 325 and ENGV 365 and ENGV 380) or (ENGV 325 and ENGV 365 and ENGV 410) or (ENGV 325 and ENGV 380 and ENGV 410) or (ENGV 336 and ENGV 345 and ENGV 365) or (ENGV 336 and ENGV 345 and ENGV 380) or (ENGV 336 and ENGV 345 and ENGV 410) or (ENGV 336 and ENGV 365 and ENGV 380) or (ENGV 336 and ENGV 365 and ENGV 410) or (ENGV 336 and ENGV 380 and ENGV 410) or (ENGV 345 and ENGV 365 and ENGV 380) or (ENGV 345 and ENGV 365 and ENGV 410) or (ENGV 345 and ENGV 380 and ENGV 410) or (ENGV 365 and ENGV 380 and ENGV 410)) and ENGI 220 and ENGR 210 and ENGR 235 and ENGR 240 and ENGR 270 and ENGR 315 and ENGR 330 and ENGV 225 and MATH 131 and MATH 132 and MATH 430 and MATH 432 and PHYS 231
This is the first senior design course where students are exposed to engineering design and product/process development. Students work in teams on engineering design projects from inception to completion to satisfy the needs and requirements of the clients. In addition to technical design, factors such as safety, economics, and ethical and societal implications are considered.
Note: ENGV 481 and ENGV 482 represent two parts of the same project; therefore, they must be taken in consecutive terms.
Offered: Residential and Online

ENGV 482 Civil Engineering Design II 3 Credit Hour(s)
Prerequisite: ENGV 481
This is the second senior design course where students are exposed to engineering design and development. Design process culminates in prototype manufacturing, testing and validation, design improvement, producing a successful prototype/process/set of design plans and specifications, and presenting to peers, clients, and faculty members.
Note: ENGV 481 and ENGV 482 represent two parts of the same project; therefore, they must be taken in consecutive terms.
Offered: Residential and Online

ENGV 492 FE Exam 0 Credit Hour(s)
Prerequisite: ENGV 481 (may be taken concurrently)
This course serves as a graduation gate to ensure that all civil engineering students take the Civil Fundamentals of Engineering (FE) Exam as a graduation requirement. The student will receive a passing grade (P) once the student demonstrates that the FE Exam was taken. The course will provide online materials to help students prepare for the FE Exam.
Offered: Residential and Online