

# 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:** Resident 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:** Resident and Online

## ENGV 250 Strength of Materials 3 Credit Hour(s)

**Online 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)

**Prerequisite:** ENGV 225 and ENGV 345 and ENGV 410

This course is the first of a two-course sequence that presents the civil engineering student to various types of laboratory work that comprise the civil engineering profession. This course will provide students the opportunity to conduct surveying field work, and perform laboratory work to assess material properties and strengths of several civil engineering materials (e.g., soils, steel). Students will perform laboratory work in teams and prepare written reports of their results.

**Offered:** Resident 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:** Resident and Online

## ENGV 336 Civil Engineering Materials 3 Credit Hour(s)

**Prerequisite:** CHEM 121 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:** Resident

## 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:** Resident and Online

## ENGV 355 Civil Engineering Lab II 2 Credit Hour(s)

**Resident Prerequisite:** ENGV 320 and ENGV 365 (may be taken concurrently) and ENGV 425 (may be taken concurrently)

**Online Prerequisite:** ENGV 320 and ENGV 365 and ENGV 425

This course is the second of a two-course sequence that presents the civil engineering student to various types of laboratory work that comprise the civil engineering profession. This course will provide students the opportunity to perform laboratory work to assess material properties and strengths of several civil engineering materials (e.g., asphalt, concrete), and conduct laboratory work in hydraulics. Students will perform laboratory work in teams and prepare written reports of their results.

**Offered:** Resident 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:** Resident 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:** Resident 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:** Resident 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:** Resident 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:** Resident

**ENGV 410 Transportation Engineering 3 Credit Hour(s)**

**Prerequisite:** ENGV 205

This course provides the student with a comprehensive introductory course in transportation engineering. Following surveying, this course presents the concepts of traffic safety, traffic flow, intersection design and control, traffic capacity, geometric design of streets and highways, and pavement design.

**Offered:** Resident and Online

**ENGV 415 Special Topics in Construction Engineering 3 Credit Hour(s)**

**Prerequisite:** ENGV 380

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:** Resident and Online

**ENGV 420 Professional Practice 2-3 Credit Hour(s)**

**Prerequisite:** 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:** Resident 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:** Resident 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:** Resident

**ENGV 440 Special Topics in Structural Engineering 3 Credit Hour(s)**

**Prerequisite:** ENGV 390 and ENGV 425

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:** Resident and Online

**ENGV 455 Special Topics Geotechnical Engineering 3 Credit Hour(s)**

**Prerequisite:** ENGV 395

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:** Resident 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:** Resident and Online

**ENGV 492 FE Exam 0 Credit Hour(s)**

**Prerequisite:** ENGR 481

This course serves as a graduation gate to assure that all civil engineering students take the 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:** Resident and Online