

CVE - CIVIL ENGINEERING (CVE)

CVE 2001 Applied Drafting and CAD: Civil (0-3-1)

This course develops skills to use CAD drafting as a means of communication in the civil and construction industry.

CVE 2013 CAD tools in Civil Engineering (1-4-3)

Covers drafting fundamentals to advanced applications of CAD in a civil engineering environment. Introduces cutting-edge technology to create CAD drawings for multiple aspects of the civil engineering construction industry. Manage multiple drawing files in a digital environment.

Prerequisites: CVE 2001

CVE 2103 Site Surveying (2-2-3)

Introduces modern surveying tools and methods used in civil engineering applications related to buildings, highways, utilities and any construction activity in the built environment. Covers the use of cutting-edge, state-of-the-art surveying equipment to perform a variety of surveying activities. Includes production of field notes, drawings, plots and calculations to meet industry standards.

Prerequisites: MTH 0103 or MTH 1103

CVE 2113 Quantity Surveying and Estimating (2-2-3)

Examines project cost measurement and monitoring relative to the client, the consultant, and the contractor. Emphasis is placed on the roles of the quantity surveyor and estimator with respect to estimation and measurement at all stages throughout the project. The course also examines the various constraints placed on the project to conform to the client's planned project expenditure, and the role of the contractor's project management team in estimating, monitoring and controlling costs, from the tender phase to completion.

Prerequisites: CVE 2103

CVE 2203 Engineering Mechanics (2-2-3)

Covers the concepts of equilibrium to determine the forces acting on static engineering structures such as beams, columns, trusses and cantilevers. Illustrate these forces graphically. Introduces methods used to calculate key structural properties related to centroids and moments of inertia that are required for structural analysis and design.

Prerequisites: PHY 1103

CVE 2213 Strength of Materials (2-2-3)

Explores fundamental engineering mechanics principles and practices to determine shear force and bending moments in structures. Assess the flexural behavior of structural members subjected to transverse loading. Apply key concepts in a hands-on, structures-related project.

Prerequisites: CVE 2203

CVE 2303 Soil Mechanics (2-2-3)

Covers the origin and formation of rocks and soils and evaluates the basic physical properties of soils as a material for use in civil engineering applications. Studies the engineering properties of soils through a set of standard laboratory tests. Covers application of engineering principles in the analysis of the test results.

Prerequisites: CVE 2603, CVE 2403

CVE 2403 Fluid Mechanics and Hydraulics (2-2-3)

Introduces the basic concepts of fluid mechanics including fluid properties, hydro statics, basic fluid flow, continuity and momentum equations, energy equations, laminar and turbulent flow and pressure losses. Includes practical work will reinforce the theory through a set of experiments in the fluid dynamics laboratory.

Prerequisites: PHY 1103

CVE 2603 Construction Materials (2-2-3)

Examines properties of key construction materials including aggregates, Portland cement, concrete, asphalt, various metals, glass and wood. Prepare and perform tests using international standards on aggregate, concrete and asphalt samples in a hands-on environment in the civil engineering workshop and laboratories.

Prerequisites: PHY 1103

CVE 2613 Civil Engineering Construction (3-1-3)

Explores topics related to earthworks operations, soil and rock excavation and soil support systems. The course also extends into covering building demolition and maintenance techniques, construction methods and practices related to steel frames, precast concrete systems as well as curtain walls and cladding systems.

Prerequisites: CVE 2603

CVE 2903 Sophomore Design Project (2-2-3)

Learn the necessary tools and information to manage engineering projects and resources. The course covers a range of principles and practices in initiating, planning, staffing, coordinating, troubleshooting and completing a project within the triple constraint of schedule, budget, and performance. The course strives to strike a balance between the general knowledge of project management and available tools, such as Primavera, OpenProj, and Microsoft Project, to assist in managing real life projects

Prerequisites: CVE 2613

CVE 3203 Structural Analysis (2-2-3)

Introduces principles of engineering mechanics and strength of materials to the analysis of determinate and indeterminate structures. Covers forces on beams, frames, and arches, analyses of structures for deflection using regional and international codes.

Prerequisites: CVE 2213

CVE 3303 Highway Engineering (3-1-3)

Extends the core knowledge and principles of surveying to the design and construction of highways. Covers regional and international geometric design parameters to highways for vertical and horizontal alignment, cross-sections, drawing preparation, drainage, and intersections at grade and interchanges. Emphasis is on design practices and construction procedures to achieve a highway with acceptable levels of performance in terms of safety, operation, economics and environmental concerns.

Prerequisites: CVE 2103

CVE 3403 Water Resources and Supply (3-1-3)

Introduces hydrologic concepts, development of water supply sources, principals involved in the collection, transportation, and distribution of water for municipal use. Covers water system management, principles of hydraulics and water cycle precipitation hydrology, design of water supply systems to international standards. Includes site visits to water supply engineering sites relevant to the development and growth of world-class, large cities.

Prerequisites: CVE 2403, CVE 2013

CVE 3503 Foundation Engineering (2-2-3)

Extends the core knowledge of soil mechanics to the analysis and design of geotechnical engineering systems. Covers shallow and deep foundations and their use in local, regional and international settings. Explores alternatives for retaining structures and related stability of soils in civil engineering applications such as excavations, road embankments and earth dams.

Prerequisites: CVE 2303

CVE 3513 Concrete Design I (2-2-3)

Covers the properties and design principles of reinforced concrete structural elements. Introduces the Limit State Design Theory and applies the principles and skills gained in structural analysis to the design of reinforced concrete structural elements. The Euro/British Codes of Practice are the basic codes of reference for all the design and detailing work in this course. The course includes the properties of structural concrete and the influence of each of its constituents on the performance of the final product.

Prerequisites: CVE 3203

CVE 4323 Transportation Planning (3-1-3)

Examines the processes involved in facilitating the planning for future transportation sustainable facilities. Covers factors to be considered in the planning of new transportation projects including traffic flow, safety, energy consumption, travel time, accessibility, socio-economic and environmental impacts. Introduces relevant sustainability and ethical issues.

Prerequisites: CVE 3303

CVE 4333 GIS Applications in Civil Engineering (1-4-3)

Examines the basic concepts and types of Geographic Information Systems (GIS) used in civil engineering practice. Covers collection and data analyses methods, to perform selected spatial operations. Introduce the five main components and functions of a GIS while differentiating between vector and raster methods for data capture. Students will be introduced to various GIS applications in civil engineering using appropriate software.

Prerequisites: CVE 2103

CVE 4353 Road Design and Construction (3-1-3)

Explores pavement types and the factors that impact their design with emphasis on equipment, materials and practices associated with the construction of flexible and rigid pavements. Maintenance methods including evaluation and rehabilitation are addressed. Explore the environmental impacts of construction and maintenance topics to sustainability, ethics and quality issues.

Prerequisites: CVE 3303

CVE 4403 Waste Water Engineering (2-2-3)

Introduces the principles of the collection, transportation, and treatment of wastewater. Covers the principles of hydraulics, urban hydrology, design sewer systems to international standards. Includes site visits to relevant sites to fully comprehend the importance of waste water engineering to the development and growth of world-class, large cities like Abu Dhabi and Dubai.

Prerequisites: CVE 3403

CVE 4413 Environmental Engineering (2-2-3)

Covers the application of the fundamental principles of science and engineering toward environmental engineering situations, recognizing it is as an interdisciplinary science. Analyze the naturally occurring environmental phenomena, industry and human induced compounds and micro-organisms, and the changes and imbalances that occur in the environment. Explore sustainability, ethics and quality of life issues.

Prerequisites: CVE 3403

CVE 4423 Solid Waste Management (3-1-3)

Examines the different sources of solid waste management. Includes investigation of the important aspects of waste control legislation, waste reduction and waste recycling. Covers sustainability strategies to protect the local and global environment. Introduces local and international approaches to handling and disposal of hazardous waste, and quality assurance measures.

Prerequisites: CVE 3403

CVE 4443 Coastal Engineering (3-1-3)

Examines modern technology for civil engineering projects in a marine environment. The significant development along the shores of the UAE including the creation of coastline provide the backdrop for the course. Coastal climates, tides, waves and environmental issues are addressed. Construction techniques and structures including piles, break-walls, piers and off-shore facilities are part of the course. Computer modelling and relevant site visits round out the students learning experience.

CVE 4503 Steel Design (2-2-3)

The course looks into the impact of wind loads on portal frames. The design and analysis of a steel cantilever and a simple beam with its compression flange fully restrained/unrestrained laterally are covered. The course also focuses on design of tension/compression members of roof trusses. Columns are designed to withstand axial and combined flexural and compression forces. Welded, bolted, and base plate connections are investigated. STAAD Pro and other software are used to analyze and design various steel elements. The Eurocode 3 is the standard for all design and detailing work.

Prerequisites: CVE 3203

CVE 4513 Concrete Design II (2-2-3)

Apply the basics of design procedures, construction methods and detailing of reinforced concrete elements and structures to the design of specific concrete structural elements. Using the relevant regional or international code, design and detailing concrete footings, pile foundations, walls, shear walls, columns, beams, and slabs for reinforced concrete buildings.

Prerequisites: CVE 3513

CVE 4523 Steel Design II (3-1-3)

Design of connections for structural elements like a beam splice, column splice and connections for moment and braced frames. Analyze and design a continuous beam of four spans with its compression flange fully restrained laterally. Design of members subjected to combined flexural and axial forces. Analyze and design two story, three bay, braced and moment frames for gravity and lateral loads. Complete design of small industrial building for gravity and lateral loads. Explore the design parameters of steel bridges of the following types: trusses, arches, suspension and cable stayed bridges.

Prerequisites: CVE 4503

CVE 4603 Construction Contract Management (3-1-3)

Applies the principles and procedures involved in effective administration and management of engineering contracts, from tender to final completion. Explores the legal implications of contract documents; major issues in pricing and bidding; preparation of tenders and work breakdown for bidding; reading tender documents and estimating the cost of work; initiating, negotiating and signing agreements; coordinating with General Services as per UAE procedures.

Prerequisites: CVE 2113

CVE 4803 Special Topics in Civil Engineering (3-1-3)

Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses. Can be repeated for credit.

CVE 4902 Capstone Design Project I (1-3-2)

Form project teams through coordination in order to identify civil engineering-related problems through research; and provide solutions to tackle those by defining design constraints and engineering standards. Students are required to design, develop and improve a product, process or a system related to civil engineering and apply appropriate tools and techniques to solve industry-related or real-world problems in civil engineering. The groups are required to apply project/time management techniques for delivering the project and achieving the objectives within specified constraints.

Prerequisites: EGN 3012, (EGN 3812 or EGN 3806 or EGN 3803)

Corequisites: EGN 3212

CVE 4912 Capstone Design Project II (1-3-2)

Form project teams through coordination in order to identify civil engineering-related problems through research; and provide solutions to tackle those by defining design constraints and engineering standards. Students are required to design, develop and improve a product, process or a system related to civil engineering and apply appropriate tools and techniques to solve industry-related or real-world problems in civil engineering. The groups are required to apply project/time management techniques for delivering the project and achieving the objectives within specified constraints.

Prerequisites: CVE 4902