CIVIL & ENVIRONMENTAL ENGINEERING (CEE)

Visit the Course Schedule Search website to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

CEE 400 - Introduction to Civil Engineering
Credits: 0 or 4
Introduction to the civil engineering profession: structural, geotechnical, water resources, materials, and environmental. Overviews the civil project process including the creative design process, teamwork, bidding and construction. The relationship between civil engineering works and society including ethics, earthquakes, failures, successful signature structures, current events, and professional licensure. The production of professional engineering documents including writing tasks and calculations sets. Campus resources, the University system, and relationship between required curriculum, student objectives, and the civil engineering profession. Introduction to spreadsheet software, data analysis, and probability and statistics.
Attributes: Environment,TechSociety(Disc); Inquiry (Discovery)
Equivalent(s): CIE 402
Grade Mode: Letter Grading

CEE 402 - 2D Computer Aided Design
Credits: 3
This course will serve as an introduction to some of the fundamental principles of building design and land planning. You will prepare plans representative of building construction and land development commonly used in the architectural, engineering, surveying and construction fields. The emphasis will be on the end result: Preparing complete and professional plans. Through this, you will acquire basic skills in designing and plan layout required by these industries. We will approach this material by designing and drafting using computer software (AutoCAD). Another end outcome is that you will gain a certain level of competency with this AutoCAD software, a program used by the majority of the firms in these professions.
Equivalent(s): TECH 564
Grade Mode: Letter Grading

CEE 403 - GIS for Civil and Environmental Engineering
Credits: 3
This course will serve as an introduction to some of the fundamental principles of Geographic Information Systems integral to Civil and Environmental Engineering. Students will develop an understanding of imagery and data acquisition; develop skills in identification, interpretation, and mapping of civil and land features, terrain analysis, and achieve an understanding of map projections; gain experience in GIS software to perform fundamental geoprocessing and mapping techniques.
Grade Mode: Letter Grading

CEE 404 - Surveying and Mapping
Credits: 0 or 4
Principles of land measurements by ground, photogrammetric and satellite methods to model the environment. Application of theory of measurements to perform and adjust engineering survey. Conformal mapping and its application to state plane coordinates. Digital mapping and Geographic Information Systems. Construction and cadastral surveying. Lab.
Prerequisite(s): MATH 425 (may be taken concurrently) with a minimum grade of D- or MATH 425H (may be taken concurrently) with a minimum grade of D-.
Equivalent(s): CIE 505
Grade Mode: Letter Grading

CEE 420 - Environmental Engineering Gateway
Credits: 3
Introduces the profession, the environmental engineer as planner, designer, problem solver, and interdisciplinary team player; and the goals of the environmental engineering curriculum. Lectures by faculty and practitioners. Introduction to computer skills required for environmental engineering. Engineering ethics.
Equivalent(s): ENCV 400, ENE 400
Grade Mode: Letter Grading

CEE 500 - Statics for Civil Engineers
Credits: 3
Introduction to statics with emphasis on civil engineering topics; two and three dimensional force systems; static equilibrium; friction; analysis of trusses and beams; centroids; and moment and shear diagrams for flexural members.
Prerequisite(s): (PHYS 407 with a minimum grade of D- or PHYS 407S with a minimum grade of D- or PHYS 407H with a minimum grade of D-) and (MATH 426 (may be taken concurrently) with a minimum grade of D- or MATH 426H (may be taken concurrently) with a minimum grade of D-).
Equivalent(s): CIE 525, CIE 528, ME 525
Grade Mode: Letter Grading

CEE 501 - Strength of Materials
Credits: 3
Strength of materials with emphasis on civil engineering applications. Virtual work; work and energy relationships; analysis of members subjected to flexure, torsion, and axial loads; stresses and strains; and stability of columns.
Prerequisite(s): MATH 426 with a minimum grade of D- or CEE 500 with a minimum grade of D- or ME 525 with a minimum grade of D-.
Equivalent(s): CIE 526, CIE 529, ME 526
Grade Mode: Letter Grading

CEE 502 - Project Engineering
Credits: 3
Techniques for financial analysis, and operation and management of engineering systems, engineering economics, material take-offs, estimating, scheduling, modeling physical systems, and decision-making. CEE major or permission.
Equivalent(s): CIE 533, CIE 633, CIE 733
Grade Mode: Letter Grading

CEE 505 - Introduction to Sustainable Engineering
Credits: 3
This course begins with exploration of the precept that we live in, and must design engineering works for, a world with a finite supply of natural resources and with limited life support capacity. Tools for sustainability engineering are the focus of the course, which includes life cycle analysis and life cycle impact analysis, the metrics and mass and energy flow analyses used in the field of industrial ecology, and environmental management systems.
Grade Mode: Letter Grading

CEE 520 - Environmental Pollution and Protection: A Global Context
Credits: 0 or 4
Introduces environmental science and engineering and the anthropogenic causes of environmental change. Emphasizes the causes, effects, and controls of air, water, and land pollution. The political, ecological, economic, ethical, and engineering aspects of environmental pollution and control are discussed. Field trips.
Attributes: Environment,TechSociety(Disc); Writing Intensive Course
Equivalent(s): BIOL 520, ENCV 520, ENE 520
Grade Mode: Letter Grading

CEE 620 - One Water Engineering
Credits: 4
Application of fundamental concepts on water engineering as a single resource. Students will learn core design principles for integrated physical, chemical, and biological treatment processes combined with planning and system integration for sustainable and equitable drinking water, wastewater, graywater, and stormwater management.
Prerequisite(s): (CHEM 404 with a minimum grade of D- or CHEM 405 with a minimum grade of D-) and CEE 650 with a minimum grade of D- and CEE 520 with a minimum grade of D-.
Equivalent(s): ENCV 645, ENE 645
Grade Mode: Letter Grading

CEE 635 - Engineering Materials
Credits: 0 or 4
Structural properties and applications of the various materials used in civil engineering projects, including steel, cement, mineral aggregates, concrete, timber, and bituminous materials. Microstructure and properties of common metals, plastics, and ceramics. Lab.
Attributes: Writing Intensive Course
Prerequisite(s): CEE 501 with a minimum grade of D- or ME 526 with a minimum grade of D-.
Equivalent(s): CIE 622
Grade Mode: Letter Grading

CEE 650 - Fluid Mechanics
Credits: 0 or 4
Properties of fluids, fluid statics, continuity, momentum and energy equations, resistance to flow, boundary layer theory, flow in open channels and piping systems, dimensional analysis, similitude, drag, and lift. Laboratory exercises on measurement of fluid properties, energy principles, flow resistance, discharge measurements, momentum, hydropower, groundwater flow, and settling of spheres. Lab.
Attributes: Writing Intensive Course
Prerequisite(s): PHYS 407 with a minimum grade of D- or PHYS 407S with a minimum grade of D- or PHYS 407H with a minimum grade of D-.
Equivalent(s): CIE 642
Grade Mode: Letter Grading

CEE 665 - Soil Mechanics
Credits: 0 or 4
Soil classification and physical properties. Permeability, compressibility, consolidation, and shearing resistance are related to the behavior of soils subjected to various loading conditions. Lab.
Prerequisite(s): CEE 635 with a minimum grade of D- and CEE 650 with a minimum grade of D-.
Equivalent(s): CIE 665
Grade Mode: Letter Grading

CEE 680 - Classical Structural Analysis
Credits: 3
Analytical stress and deflection analysis of determinate and indeterminate structures under static and moving loads by classical methods.
Prerequisite(s): CEE 501 with a minimum grade of D-.
Equivalent(s): CIE 681
Grade Mode: Letter Grading

CEE 700 - Building Information Modeling
Credits: 3
Building Information Modeling (BMI) is the process of generating and managing project data during its life cycle by integrating 3D multidisciplinary drawings with dynamic scheduling and visualization. BIM provides a digital representation of project data to facilitate the exchange of information beyond the standard two dimensional plan set. This course introduces students to the fundamentals of model creation, scheduling, material take-offs, visualizations, and animations that improve the communication of information to potential clients.
Prerequisite(s): CEE 402 (may be taken concurrently) with a minimum grade of D-.
Equivalent(s): CIE 780
Grade Mode: Letter Grading

CEE 703 - Site Design and Project Development
Credits: 3
Provides an in-depth introduction to the various design activities undertaken for Land Development (Site Design) projects. Investigates aspects of site design: parking, grading, drainage, traffic, due diligence, permitting, cost estimating, and financing. Introduces concepts of Project Development process including project management, financing, delivery methods, design development, client relations, and construction administration. Course format will include lectures, guest presenters, and site visits. Grading based upon writing examination, assignments, group project, and professional development activities.
Prerequisite(s): CEE 502 with a minimum grade of D-.
Equivalent(s): CIE 753
Grade Mode: Letter Grading

CEE 704 - Transportation Engineering: Highway Geometric Design
Credits: 3
Fundamental relationships of traffic speed, density, and flow applied to public and private modes of transport. Principles of demand forecasting and urban systems planning.
Equivalent(s): CIE 751, CIE 754
Grade Mode: Letter Grading

CEE 705 - Introduction to Sustainable Engineering
Credits: 3
This course begins with exploration of the precept that we live in, and must design engineering works for, a world with a finite supply of natural resources and with limited life support capacity. Tools for sustainability engineering are the focus of the course, which includes life cycle analysis and life cycle impact analysis, the metrics and mass and energy flow analyses used in the field of industrial ecology, and environmental management systems.
Grade Mode: Letter Grading

CEE 706 - Environmental Life Cycle Assessment
Credits: 3
This course teaches knowledge and hands-on-skills in conducting environmental life cycle assessment (LCA), which is a widely used technique by industries, academics, and governments. Students will learn to use popular LCA software (e.g. SimaPro), apply proper LCA techniques, critically analyze LCA results, and provide client-oriented suggestions during this course. Class time is primarily devoted to a combination of lectures and computer labs.
Grade Mode: Letter Grading

CEE 719 - Green Building Design
Credits: 3
This course gives an overview of green designs and sustainable practices in building construction. We will cover technical topics and requirements of a nationally recognized rating system (LEED), with a specific focus on Green Building Design and Construction. Students are introduced to basic building designs and systems related to sustainability. Additionally, they learn about green design topics such as site plans, water and energy efficiency, material and resources usage, environmental quality and renewable energy source. As an outcome of the course, students are able to assess and incorporate green technologies and designs into building projects.
Equivalent(s): CIE 781
Grade Mode: Letter Grading

CEE 720 - Waste Management and Site Remediation
Credits: 3
The course has two main areas of focus: (1) solid and hazardous waste management, including the key regulations and engineering approaches, such as landfills, waste-to-energy combustion, composting, and material recovery facilities; and (2) contaminated site remediation, including the key regulations, site characterization, risk-based decision making, transport and fate of contaminants, and an introduction to remediation technologies.
Equivalent(s): ENCV 742, ENE 742
Grade Mode: Letter Grading

CEE 721 - Environmental Sampling and Analysis
Credits: 4
Theory of analytical and sampling techniques used in environmental engineering. Topics include potentiometry, spectroscopy, chromatography, automated analysis, quality control, sampling design, and collection methods. Methods discussed in lecture are demonstrated in labs. Lab.
Prerequisite(s): (CHEM 404 with a minimum grade of D- or CHEM 405 with a minimum grade of D-) and CEE 620 with a minimum grade of D-.
Equivalent(s): CEE 721W, ENCV 643, ENE 643, ENE 743, ENE 743W
Grade Mode: Letter Grading

CEE 722 - Introduction to Marine Pollution and Control
Credits: 4
Introduces the sources, effects, and control of pollutants in the marine environment. Dynamic and kinetic modeling; ocean disposal of on-shore wastes, shipboard wastes, solid wastes, dredge spoils, and radioactive wastes; and oil spills.
Prerequisite(s): CEE 620 with a minimum grade of D-.
Equivalent(s): ENCV 747, ENE 747
Grade Mode: Letter Grading

CEE 723 - Environmental Engineering Chemistry
Credits: 4
Chemical equilibrium principles of thermodynamics, acids/bases, precipitation/dissolution, oxidation/reduction, and complexation applied to surface water, groundwater, water and wastewater treatment. Applications to legacy and emerging organic and inorganic contaminants.
Prerequisite(s): CHEM 404 with a minimum grade of D- or CHEM 405 with a minimum grade of D-.
Equivalent(s): ENCV 749, ENE 749
Grade Mode: Letter Grading

CEE 724 - Environmental Engineering Microbiology
Credits: 4
Concepts of environmental engineering microbiology. Topics include taxonomy of species important in environmental engineering processes; microbial metabolism, interaction, and growth kinetics in environmental treatment processes; biogeochemical cycling in water; and effects of environmental parameters on environmental engineering microbial processes. Laboratories focus on microbiological methods and laboratory-scale biological treatment experiments. Lab.
Attributes: Writing Intensive Course
Prerequisite(s): CEE 520 with a minimum grade of D- and CEE 650 with a minimum grade of D-.
Equivalent(s): ENCV 656, ENE 656, ENE 756
Grade Mode: Letter Grading

CEE 729 - Sources, Control, and Stewardship of Air Pollution
Credits: 4
Sources and fate of air pollutants from natural and engineered systems. Fundamentals of pollutant chemistry, atmospheric dispersion, and engineering controls. Includes regulatory policy, environmental, and social justice issues.
Grade Mode: Letter Grading

CEE 730 - Public Health Engineering for Rural and Developing Communities
Credits: 3
The application of environmental health engineering and sanitation principles in disease prevention and control are discussed. Special emphasis is given to areas of the world where communicable and related diseases have not yet been brought under control and to what can happen in more advanced countries when basic sanitary safeguards are relaxed. The following topics are covered: water-related diseases to include their transmission and control; safe water development, treatment, distribution and storage; and on-site wastewater treatment and disposal system.
Equivalent(s): ENCV 740, ENE 740
Grade Mode: Letter Grading

CEE 731 - Advanced Water Treatment Processes
Credits: 4
The advanced design of physical, chemical, and biological treatment processes for water and wastewater systems. Emphasis on both conventional and innovative treatment processes, including technologies for emerging issues and contaminants.
Equivalent(s): ENCV 744, ENE 744
Grade Mode: Letter Grading

CEE 732 - Solid Waste Facility and Remediation System Design
Credits: 4
Focuses on the design of solid waste facilities, including landfills, waste-to-energy facilities and materials recovery facilities, and the design of remediation systems including soil vapor extraction and thermal treatment. Landfill design will include the basic design principles of the liner, leachate collection system, and landfill gas management. Remediation system design will focus on cleanup technologies implemented at contaminated sites.
Prerequisite(s): CEE 720 with a minimum grade of D-.
Equivalent(s): ENCV 748, ENE 748
Grade Mode: Letter Grading

CEE 733 - Public Infrastructure Asset Management
Credits: 4
The course provides a thorough examination of the growing engineering field of Public Infrastructure Assess Management (IAM). The course enables the student to design an IAM system. It touches upon all types of public infrastructure with a particular focus on water infrastructure for the semester design project. Students build upon their engineering economics and project engineering skills and use simple IAM software along with GIS applications. Practice leaders from the industry provide guest lectures throughout the semester. A focus on triple bottom line or the Societal, Environmental and Economic aspects of IAM are included. The format is a modified team base design learning experience providing practice in processing of technical lecture material, personal performance evaluation (frequent quizzes) and team based performance evaluation. Student groups will present their design to the class and provide a written engineering report.
Prerequisite(s): CEE 502 (may be taken concurrently) with a minimum grade of D- and CEE 620 (may be taken concurrently) with a minimum grade of D-.
Equivalent(s): ENE 739
Grade Mode: Letter Grading

CEE 735 - Properties and Production of Concrete
Credits: 3
Basic properties of hydraulic cements and mineral aggregates, and their interactions in the properties of plastic and hardened concrete; modifications through admixtures; production handling and placement problems; specifications; quality control and acceptance testing; lightweight, heavyweight, and other special concretes.
Prerequisite(s): CEE 635 with a minimum grade of D-.
Equivalent(s): CIE 722
Grade Mode: Letter Grading

CEE 736 - Asphalt Mixtures and Construction
Credits: 3
Specification of asphalt cements, aggregates and proportioning of mixture constituents for paving applications. Asphalt mixture design methods, production, construction, and quality control are discussed. Current new material production and construction technologies are introduced.
Prerequisite(s): CEE 635 with a minimum grade of D-.
Equivalent(s): CIE 723
Grade Mode: Letter Grading

CEE 737 - Pavement Rehabilitation, Maintenance, and Management
Credits: 3
This course covers the technical and financial strategies to extend the life of highway and airfield pavements. The course topics will include: Assessment of pavement functional and structural condition, suitability of pavement maintenance and repair techniques, use of pavement preservation processes, and application of asset management to extend the life of pavement infrastructure.
Prerequisite(s): CEE 635 with a minimum grade of D-.
Grade Mode: Letter Grading

CEE 749 - Pavement Design and Analysis
Credits: 4
Introduction to flexible and rigid pavement design and analysis for highways and airports. Examines design inputs, materials, analysis methods, design tools, and maintenance treatments. Students will conduct a pavement design project. This course satisfies a senior level materials principal design elective in the CEE department.
Prerequisite(s): CEE 635 with a minimum grade of D- and CEE 665 with a minimum grade of D-.
Equivalent(s): CIE 721
Grade Mode: Letter Grading

CEE 751 - Open Channel Flow
Credits: 3
Energy and momentum principles in open channel flow; flow resistance; channel controls and transitions; unsteady flow concepts and dam failure studies. Modeling with HEC programs.
Prerequisite(s): CEE 650 with a minimum grade of D-.
Equivalent(s): CIE 741
Grade Mode: Letter Grading

CEE 753 - Snow Hydrology
Credits: 3
Snow is a significant component of the hydrologic cycle in high latitude and high elevation environments. It is also a part of engineering design and practice that is frequently overlooked. In this course, we will examine spatial controls on snow accumulation and the dynamics of snowmelt processes through readings in snow hydrology, field assays of snow distribution, and analytical exercises. Of particular interest will be the role of snow in water resource engineering.
Prerequisite(s): CEE 650 with a minimum grade of D- and (MATH 539 with a minimum grade of D- or MATH 644 with a minimum grade of D-).
Grade Mode: Letter Grading

CEE 754 - Engineering Hydrology
Credits: 3
Hydrologic cycle, probability theory related to hydrology and the design of water resources structures, water law, flood discharge prediction, hydrograph development, hydraulic and hydrologic river routing, reservoir routing, theory of storage, reservoir operations, hydropower development, modeling of watershed hydrology with program HEC-1, HEC-HMS, multipurpose projects.
Equivalent(s): CIE 745
Grade Mode: Letter Grading

CEE 755 - Design of Pressurized Water Transmission Systems
Credits: 4
Theory developed for individual components to large complex systems. Analysis and designs of components and systems. Topics include: steady and unsteady closed conduit flow, valves and meters, pump requirements, pump selection, system planning and layout, water hammer, and system operation and maintenance. Pressure system modeling with program EPANET.
Prerequisite(s): CEE 650 with a minimum grade of D-.
Equivalent(s): CIE 755
Grade Mode: Letter Grading

CEE 758 - Stormwater Management Designs
Credits: 3
Historic review of stormwater management leading up to the current regulatory framework. Overview of stormwater management strategies, strategy selection, and the targeting of specific contaminants, contaminant removal efficiencies, construction and site selection, and system maintenance. Hydrologic concepts including watershed and storm characteristics, design hydrology (peak flows, storm and treatment volumes), hydrograph routing, and critical review of hydrology and drainage reports. Design and sizing of treatment systems including: conventional, BMPs, low impact development, and manufactured devices. Rainfall runoff calculations with US SCS TR55 model.
Prerequisite(s): CEE 650 with a minimum grade of D-.
Equivalent(s): CIE 758
Grade Mode: Letter Grading

CEE 759 - Stream Restoration
Credits: 4
The assessment, planning, design, engineering, and monitoring of stream and watershed practices intended to protect and restore the quality and quantity of flowing surface waters and stream corridors. Lecture material covers hydrology, geomorphology, and ecosystems, with the intent of understanding the variables associated with stream systems and their interplay. Students measure field variables and then are challenged with actual designs. Examples of stream restoration issues include: in-stream flow, dam removal, induced recharge, improvements to fish habitat, and channel stabilization.
Prerequisite(s): CEE 650 with a minimum grade of D-.
Equivalent(s): CIE 759
Grade Mode: Letter Grading

CEE 765 - Engineering Behavior of Soils
Credits: 4
Review of stress and strain in soil. Introduction to continuum mechanics. Development of engineering soil properties. Application of soil mechanics to shear strength and stress-strain behaviors of soils. Failure states and residual strength. Application of stress paths in engineering problems. Unstaturated soil mechanics. Laboratory exercises using direct shear test, triaxial test, and soil-water retention measurements.
Equivalent(s): CIE 767
Grade Mode: Letter Grading

CEE 766 - Introduction to Geotechnical Earthquake Engineering
Credits: 3
Overviews earthquake source mechanisms; magnitude and intensity; seismicity of the United States. Dynamics of simple structures; response spectra. Selection of design parameters; source, magnitude, input records. Measurement of dynamic characteristics of soils; site response, liquefaction, and ground deformation.
Prerequisite(s): CEE 778 with a minimum grade of D-.
Equivalent(s): CIE 762
Grade Mode: Letter Grading

CEE 768 - Geo-Environmental Engineering
Credits: 3
Soil composition and structure; contaminant fate and transport; containment design including landfills, geo-synthetics for liners and covers, and leachate collection systems; vertical cutoff walls and slope stability analyses; geo-environmental site characterization and investigation using geotechnical and geophysical methods; ground water, soil and gas monitoring and sampling; remediation including in situ and ex situ techniques and treatment methods.
Equivalent(s): CIE 766
Grade Mode: Letter Grading

CEE 778 - Foundation Design I
Credits: 4
Foundation design based on subsurface investigation and characterization using current methods of laboratory and in situ testing. Use of consolidation theory and bearing capacity theory for the design of shallow foundations including footings and rafts. Basic design of pile foundations. Earth pressure theory applied to design of retaining walls. Slope stability theory and applications.
Prerequisite(s): CEE 665 with a minimum grade of D-.
Equivalent(s): CIE 760
Grade Mode: Letter Grading

CEE 779 - Foundation Design II
Credits: 3
Advanced pile and pier design under vertical and lateral loads. Slope stability by circular and noncircular arc methods. Design of flexible bulkhead walls and mechanically stabilized walls. Excavation and dewatering. Soil and site improvement.
Prerequisite(s): CEE 778 with a minimum grade of D-.
Equivalent(s): CIE 761
Grade Mode: Letter Grading

CEE 780 - Matrix Structural Analysis and Modeling
Credits: 3
Modeling and analysis of determinate and indeterminate structures by matrix computer methods. Creation of matrix elements using compatibility, equilibrium, and constitutive relationships. Plane trusses, beams, frames, and space trusses.
Prerequisite(s): CEE 680 with a minimum grade of D-.
Equivalent(s): CIE 685, CIE 783
Grade Mode: Letter Grading

CEE 781 - Dynamics of Structures
Credits: 3
Dynamics of single- and multi-story buildings. Response due to earthquakes, blasting, traffic, and mechanical equipment. Analysis in the time domain and through the Fourier Transform. Fundamentals of structural vibration measurement.
Prerequisite(s): CEE 780 with a minimum grade of D-.
Equivalent(s): CIE 787
Grade Mode: Letter Grading

CEE 789 - Timber Design
Credits: 3
Introduces the design of timber structures. Structural properties of wood, determination of horizontal and vertical loads, horizontal and vertical load-resisting systems, and design of horizontal diaphragms, shear walls, beams, and columns. Bolted, screwed, and nailed connections.
Prerequisite(s): CEE 680 with a minimum grade of D-.
Equivalent(s): CIE 782
Grade Mode: Letter Grading

CEE 790 - Structural Design in Masonry
Credits: 3
Introduces the design of reinforced masonry structural members by the stress and strength method and considering deflection and other serviceability performance crtieria. Includes development of wind and seismic load, curtain wall, shear wall, lintels and columns. Prereq: CEE 635, CEE 680; or permission.
Prerequisite(s): CEE 635 with a minimum grade of D- and CEE 680 with a minimum grade of D-.
Equivalent(s): CIE 776
Grade Mode: Letter Grading

CEE 791 - Reinforced Concrete Design
Credits: 0 or 4
Introduces the design of reinforced concrete structural members by the strength method and considering deflection performance. Includes loads, approximate analyses, slabs, beams, and columns.
Prerequisite(s): CEE 635 with a minimum grade of D- and CEE 680 with a minimum grade of D-.
Equivalent(s): CIE 774
Grade Mode: Letter Grading

CEE 792 - Pre-stressed Concrete
Credits: 3
Analysis and design of prestressed and post-tensioned concrete sections in flexure and shear. Strength, deflection, and losses in flexural members. Optimization of section and prestressing force selection.
Prerequisite(s): CEE 791 with a minimum grade of D-.
Grade Mode: Letter Grading

CEE 793 - Structural Design in Steel
Credits: 4
Introduction to steel member design, including horizontal and vertical members for design and analysis of buildings. Examines design inputs, material choice, analysis methods and design and construction methodologies.
Prerequisite(s): CEE 635 with a minimum grade of D- and CEE 680 with a minimum grade of D-.
Equivalent(s): CIE 793
Grade Mode: Letter Grading

CEE 794 - Bridge Design
Credits: 3
Analysis of two-span, continuous, slab and beam bridges using the AASHTO LRFD Bridge Design Specifications. Use of influence lines, load distribution, load factoring, deck design, analysis and design of composite beams and plate girders. Bridge aesthetics.
Prerequisite(s): CEE 791 with a minimum grade of D- and CEE 793 (may be taken concurrently) with a minimum grade of D-.
Equivalent(s): CIE 792
Grade Mode: Letter Grading

CEE 795 - Independent Study
Credits: 1-4
Seniors in good standing may pursue independent studies under faculty guidance. A written culminating report is required.
Repeat Rule: May be repeated up to unlimited times.
Equivalent(s): CIE 795
Grade Mode: Letter Grading

CEE 796 - Special Topics
Credits: 1-4
Advanced or specialized topics not normally covered in regular course offerings. May be repeated, but not in duplicate areas.
Repeat Rule: May be repeated up to unlimited times.
Equivalent(s): CIE 795
Grade Mode: Letter Grading

CEE 797 - Introduction to Project Planning and Design
Credits: 2
Part one of a two-part sequence. Student groups develop a project statement to address a large-scale civil engineering system design. Each team prepares a project plan to be executed in CEE 798, part two of this sequence.
Equivalent(s): CIE 784
Grade Mode: Letter Grading

CEE 798 - Project Planning and Design
Credits: 2
Student groups are formed into design teams to prepare a design plan for a large-scale civil engineering system including consideration of budgetary constraints, building code criteria, and environmental impacts. Each team prepares a final written report and gives a formal presentation.
Attributes: Writing Intensive Course
Prerequisite(s): CEE 797 with a minimum grade of D-.
Equivalent(s): CIE 682, CIE 788
Grade Mode: Letter Grading

CEE 799H - Senior Honors Thesis
Credits: 1-3
Students in the honors program in Civil and Environmental Engineering need to complete a total of 4 credits of honors thesis during the senior and junior years, which may be used to fulfill a CEE non-design elective. CEE 799H is a two-semester thesis project guided by a faculty advisor and resulting in a written thesis in a journal article format. Students are to register for 1 credit of honors thesis during the first semester and 3 credits of honors thesis during the second semester. The student should meet with potential honors thesis faculty advisors in advance and work out what will be required with the professor willing to serve.
Attributes: Honors course
Repeat Rule: May be repeated for a maximum of 4 credits. May be repeated up to 2 times.
Equivalent(s): CIE 799H
Grade Mode: Letter Grading