

Civil Engineering (CEEN)

CEEN 5303 Advance Topics in Civil Eng 1-3 SCH (1-3)

One or more advanced topics. May be repeated for credit with change in topic.

CEEN 5304 Internship in Civil Eng 1-3 SCH (1-3)

Allows civil engineering graduate students the opportunity to participate in internships with industry, government, and consulting companies in career-based practical activities to broaden the skills obtained through curricular education. Attention will be given to select opportunities where the job training enhances the particular research needs of each student. Credit/Noncredit.

CEEN 5305 Graduate Research Project 3 SCH (3)

Designed for project option students and requires completion of research project. Prerequisite: departmental approval. May be repeated for a maximum of 6 semester hours.

CEEN 5306 Thesis 3 SCH (3)

Designed for thesis option students. The course requires completion of thesis research. Prerequisite: departmental approval. May be repeated for maximum of 6 semester hours.

CEEN 5310 Theory of Elasticity 3 SCH (3-0)

Introduction to index and tensor notations; discussion of the concept of stress, strain, deformations, strain compatibility and constitutive relations; formulation and solution of extension, bending, torsion and two-dimensional elasticity problems. (Credit may not be obtained in both CEEN 5310 and MEEN 5320.)

CEEN 5311 Adv Reinforced Conc Design 3 SCH (3-0)

Analysis and design of flat plate, flat slab and two-way slab systems for gravity loads and lateral loads. Yield line theory of slabs. Deep beams, shear-friction, brackets and corbels. Length effects on braced and unbraced columns. Undergraduate knowledge of reinforced concrete design is expected.

CEEN 5312 Reinforced Conc Slab Design 3 SCH (3-0)

Elastic plate theory, finite difference, behavior of two-way slabs, ACI code design methods, upper and lower bound methods, serviceability, shear strength, pre-stressed slabs.

CEEN 5313 Numerical Methods in Civil Eng 3 SCH (3-0)

Numerical methods for advanced analysis and design applications in Civil Engineering. Prerequisite: (Credit may not be obtained for both CEEN 5313 and MEEN 5313.)

CEEN 5314 Finite Element Methods 3 SCH (3-0)

Principles and applications of the Finite Element Method: energy based variational principle methods, the principles of virtual work, weighted residual methods. Emphasis on structural and nonstructural elements and applications.

CEEN 5315 Hydraulics of Open Channels 3 SCH (3)

Application of momentum and energy principles to advanced topics in uniform, nonuniform, gradually varied and rapidly varied flow problems. Backwater flow profile computation in steady flow. The method of characteristics applied to unsteady flows. Jeffreys-Verdernikov criteria. Flood routing calculations by advanced computer methods. Undergraduate knowledge of fluid mechanics is expected.

CEEN 5316 Fiber Composite Mechanics 3 SCH (3-0)

Introductions of basic composite material technologies, properties of classic laminate theory, transformation of stresses and strains, failure theories, performance under adverse conditions, structural design considerations, computer applications, application of composites to concrete structures and practical case studies.

CEEN 5320 Foundation Engineering I 3 SCH (3-0)

Engineering characteristics of soils, consolidation, soil strength and bearing capacity for the analysis and design of spread and continuous footings, compensated foundations and deep foundations.

CEEN 5321 Structural Dynamics 3 SCH (3-0)

Dynamic disturbances, such as earthquakes and blasting. Vibration of beams, frames and floor systems; response to various types of external disturbances; energy methods. Undergraduate knowledge of dynamics is expected.

CEEN 5322 Foundation Engineering II 3 SCH (3-0)

Engineering characteristics of soils, soil strength, lateral earth pressure theories, analysis of braced walls for excavation, retaining walls, sheet-pile walls and cofferdams.

CEEN 5324 Heavy Construction 3 SCH (3-0-0)

This course covers topics related to managing heavy construction projects. Construction methods, equipment, safety, cost estimation and scheduling for highways, bridges, tunnels, dams, and ports construction projects.

CEEN 5325 Risk Management Construction 3 SCH (3-0-0)

This course covers an advanced overview of managing risks in civil and construction projects. Theories, tools and techniques for managing risks at project level are introduced. The course discusses the risk management process, qualitative and quantitative risk assessment methods, and common risks in construction projects.

CEEN 5326 Adv Construction Management 3 SCH (3-0)

Advanced theory, methods, and analytical tools to efficiently plan, schedule, estimate, organize, implement, and monitor civil engineering projects from inception to construction and start-up.

CEEN 5332 Structural Wood Design 3 SCH (3-0)

Design of wood structures with focus on allowable stress design considering material properties and environmental effects. Analysis and design of diaphragms, flexural members, axial members, and connections.

CEEN 5333 Advanced Strength of Materials 3 SCH (3-0)

Torsion of noncircular sections, membrane theory of shells, bending of plates and beams on elastic foundations. Two dimensional elasticity theory. Undergraduate knowledge of strength of materials is expected.

CEEN 5335 Prestressed Concrete 3 SCH (3-0)

Principles and methods of design of members subject to linear prestressing; time-dependent variables and long-time deflections. Prestressed columns. Undergraduate knowledge of reinforced concrete design is expected.

CEEN 5337 Advanced Structural Analysis 3 SCH (3-0)

Theorems of external work and internal strain energy. Classical methods of analysis. Continuous girders and frames with variable moments of inertia. Influence lines for redundant reactions. Analysis of sideways by moment distribution. Introduction to matrix analysis of structures. Undergraduate knowledge of structural analysis is expected.

CEEN 5340 Water Resources Engineering 3 SCH (3-0)

Comprehensive integration of engineering, economics, environmental, legal and political considerations in water resources development and management, current issues and future direction for planning and management of water resources.

CEEN 5342 Adv Geotechnical Engineering I 3 SCH (3-0)

Advanced principles of geotechnical engineering including elastic deformation of soil, one-and two-dimensional fluid flow through soil, soil consolidation, strength of soil, stability of earth retaining structures, and slope stability.

CEEN 5350 Transportation Eng I 3 SCH (3-0)

Profession of transportation, transportation industry-systems and organizations, modes of transportation and their characteristics, transportation planning, forecasting travel demand by mode, evaluation of transportation alternatives including economic criteria, transportation systems management.

CEEN 5352 Design of Asphalt Pavements 3 SCH (3-0)

Asphalt pavement design and material selection including design of sub-grade, base, and hot mix pavement. Laboratory specifications, environmental concepts, and performance specifications.

CEEN 5353 Intelligent Transportation Sys 3 SCH (3-0)

The use of modern electronics and communication technologies to improve the performance of the transportation system. Basic principles of design intelligent transportation systems for urban and rural areas will be introduced.

CEEN 5354 Pavement Management Systems 3 SCH (3-0)

Development of pavement management systems considering life-cycle cost estimation, software applications, infrastructure asset management, pavement distress types, and pavement preservation.

CEEN 5355 Groundwater Hydrology 3 SCH (3-0)

An applied course dealing with groundwater hydrology and its interrelation with surface water, water well design, well pumps, well hydraulics, pumping tests and safe yield of aquifers, artificial recharge, flow nets, salt water intrusion and some modeling of groundwater flow. Undergraduate knowledge of fluid mechanics is expected.

CEEN 5356 Physiochemical Water Treatment 3 SCH (3-0)

Theory and fundamentals of physical and chemical unit processes used for water and wastewater treatment. Process analysis, water quality criteria and standards and pertinent journal articles are reviewed. Undergraduate knowledge of environmental engineering is expected.

CEEN 5360 Adv Structural Engineering 3 SCH (3-0)

Initial value problems, elasticity preview, basic energy principles and applications to pin-connected structures, calculus of variation, applications to plates, stability, applications to dynamics.

CEEN 5361 Adv Structural Steel Design 3 SCH (3-0)

Design of steel structural members, including composite beams, plate girders and connections following the AISC LRFD specifications. Design of frame structures including second order effects. Undergraduate knowledge of steel design is expected.

CEEN 6303 Special Topics in Civil Engineering 3 SCH (3-0)

Courses offered under this Special Topics denomination concentrate on themes not present in the current CEEN curriculum, or can also be offered to strengthen and provide further depth of study in important areas of civil engineering. Topics vary to reflect new developments and interests and interests in emerging areas of civil engineering. May be repeated when topic changes.

CEEN 6306 Proposal/Dissertation Research 1-9 SCH (0-0-1-9)

Students undertaking dissertation research in civil engineering towards fulfilling doctoral dissertation proposal and dissertation requirements are required to register for this course.