

Department of Civil and Architectural Engineering

Contact Information

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Mission

The mission of the Department of Civil and Architectural Engineering at Texas A&M University-Kingsville is to create a respectful learning environment that prepares graduates to meet industry needs, demonstrate professional responsibility, and pursue fulfilling careers.

M.S. in Civil Engineering Objectives:

After completing the M.S. in Civil Engineering degree, master's graduates will demonstrate the following skills beyond those expected of a baccalaureate recipient:

- a. A deeper understanding of problem-solving and research skills in the civil engineering field.
- b. An ability to design increasingly complex systems in the fields of geotechnical, structural, transportation, and/or water resources engineering.
- c. Professional communication skills.

Architectural Engineering (AEEN)

AEEN 5301 Systems Integration and Modeling **3 SCH (3-0)**

Building envelope, fenestration system, lighting system, energy systems, system integration, modeling and analysis.

AEEN 5302 Energy Statistics and Data Analysis **3 SCH (3-0)**

Introduction to advanced data analysis and predictive modeling techniques applied to building energy systems.

AEEN 5303 Advanced Topics in Architectural Engineering **3 SCH (3-0)**

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

AEEN 5304 Heat Transfer in Buildings **3 SCH (3-0)**

Heat transfer fundamentals; Conduction, convection and radiation; Solar radiation; Heat gain through windows; Building loads.

AEEN 5306 Thesis **3 SCH (0-3)**

Designed for thesis option students. The course requires completion of thesis research. Prerequisite: departmental approval.

AEEN 5307 Building Energy Audits **3 SCH (3-0)**

Building energy assessment principles and protocols, energy economics, energy measurement and verification, energy metric comparison and analysis, energy efficiency standards, retrofit analysis.

AEEN 5308 Sustainable Buildings **3 SCH (3-0)**

Design and construction of sustainable buildings. Renewable energy applications and energy efficient design. Repurposed and sustainable construction materials and finishes. Green buildings.

AEEN 5309 Lighting Systems and Design **3 SCH (3-0)**

Application of lighting in buildings. Electrical light sources and related equipment, types, characteristics, life, losses and efficiency. Lighting design criteria, calculation methods. Daylighting.

AEEN 5311 Advanced Reinforced Concrete 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.

AEEN 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. Undergraduate knowledge of steel design is expected.

AEEN 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 disturbance; energy methods. Undergraduate knowledge of dynamics is expected.

AEEN 5322 Foundation Engineering II **3 SCH (3-0)**

Understanding of the bearing capacity of deep foundations, installation methods of deep foundations, analysis and design of a single pile and group piles. Undergraduate knowledge of dynamics is expected.

AEEN 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.

AEEN 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 sidesway by moment distribution. Introduction to matrix analysis of structures. Undergraduate knowledge of structural analysis is expected.

AEEN 5360 Advanced 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. Undergraduate knowledge of dynamics is expected.

AEEN 5361 Advanced 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.

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 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 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 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 sidesway 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 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 5357 Advanced Concrete Pavement 3 SCH (3-0)

Overview of rigid pavement. Theoretical analysis of slabs on grade including environmental loading, traffic loading, and slab support. Pavement distresses and repairs. Design and rehabilitation of rigid pavement and runways.

CEEN 5358 Transportation Planning 3 SCH (3-0)

This course emphasizes practical applications of transportation planning in urban and rural settings. Topics include a detailed exploration of transportation policy, transportation planning analyses, and commonly used frameworks in transportation planning. Students will learn how to apply quantitative skills such as data analysis and modeling in the decision-making process. By the end of the course, students will be adept at using data to inform decisions in transportation planning.

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.

Graduate Programs

- Architectural Engineering, M.S.
- Civil Engineering, M.S.

Academic Certificates

- Construction Management, Academic Certificate

Planned Course Offerings

This section provides a comprehensive list of graduate courses offered by the Department of Civil and Architectural Engineering, along with a two-year schedule indicating when each course is expected to be available. Please note that course offerings and scheduling are subject to change based on faculty availability and student demand. To ensure steady progress toward degree completion, students are strongly encouraged to work closely with their advisor to develop a personalized academic plan.

Civil Engineering (CEEN)

Course	Fall 2026	Spring 2027	Fall 2027	Spring 2028
CEEN 5303			X	
CEEN 5304 ¹				
CEEN 5305			X	
CEEN 5306			X	
CEEN 5311				X
CEEN 5312				
CEEN 5314	X			
CEEN 5315	X			
CEEN 5316 ¹				
CEEN 5320 ¹				
CEEN 5321	X			
CEEN 5324				X
CEEN 5325		X		
CEEN 5326	X		X	
CEEN 5332	X			
CEEN 5333 ¹				
CEEN 5335		X		
CEEN 5337			X	
CEEN 5340			X	
CEEN 5342		X		X
CEEN 5350		X		
CEEN 5352				X
CEEN 5353		X		
CEEN 5354	X			
CEEN 5355				X
CEEN 5357		X		
CEEN 5360 ¹				
CEEN 5361		X		

¹ This course is available during the summer term only.

Marketable Skills

Texas A&M University-Kingsville is dedicated to equipping graduate and doctoral students with the advanced marketable skills necessary for professional and academic excellence beyond the university setting. These skills encompass a range of high-level interpersonal, analytical, and applied competencies that are sought after in today's competitive workforce.

Our graduate programs are structured to cultivate these capabilities through rigorous academic inquiry, experiential learning, faculty-mentored research, professional internships, and opportunities for scholarly and community engagement.

Below are the marketable skills cultivated through the department's graduate academic program.

Civil Engineering, M.S.

- Problem-solving research skills
- Design of complex systems
- Effective communication