

CEE MEng Concentration Curriculum Overview

Updated 8-Nov-2023

MEng, CEE Concentration:

Sustainable Infrastructure

	Fall	Winter	Spring	Summer
Engineering Leadership and Entrepreneurship	ENGR 201P Eng. Leadership Entrep: Innovation	ENGR 205P Technical Project Management	ENGR 207P People Management and Communication	
ProSeminar	X	X	X	
Track Core Courses	CEE 267P: Life Cycle Assessment Methods	CEE 268P: Green Building Design	CEE 269P: Supply-Chain Emissions Accounting	
Track Technical Electives	1 Technical Elective Ea. Quarter - From the general elective list upon approval.			
Capstone project		X	X	Optional

MEng, CEE Concentration:

Data Science in CEE

	Fall	Winter	Spring	Summer
Engineering Leadership and Entrepreneurship	ENGR 201P Eng. Leadership Entrep: Innovation	ENGR 205P Technical Project Management	ENGR 207P People Management and Communication	
ProSeminar	X	X	X	
Track Core Courses	CEE 2xxPA Intro. to Data Science Program. and Optim.	CEE 2xxPB Data Analytics		
Track Technical Electives	<ul style="list-style-type: none"> - CEE 2xxP - Data Analyt. for Build. Energy Oper. Optim. - CEE 2xxP - Data Analyt. Flex. Energy Distrib. Systems - CEE 214P - GIS and Spatial Data Analyt. for Civil and Envir. Eng. - CEE 291 - Remote Sensing of the Envir. - Or others from the general electives list upon approval. 			
Capstone project		X	X	Optional

MEng Core: Eng. Leadership and Entrepreneurship

All MEng students take these courses.

ENGR 201P Engineering Leadership and Entrepreneurship: Innovation

Catalog Description: Teaches concepts on how to develop innovate/disruptive ideas through actual delivery and adoption. Focuses on the critical thinking skills, the process of developing an idea into a product/service, and teaching a framework to foster adoption of the idea and product.

ENGR 205P Technical Project Management

Catalog Description: Project management is the most effective method of delivering products within cost, schedule, and resource constraints. Students will gain a strong working knowledge of the basics of technical project management, particularly, managing scope, planning, budgeting, resourcing, and risk management.

ENGR 207P People Management and Communication

Catalog Description: Students will gain knowledge on the strategies to effectively manage people. This includes improving recruitment and retention, training, managing conflicts, motivating people, giving feedback, and effective communication to manage each direct report.-

MEng CEE, Sustainable Infrastructure Core Courses

MEng CEE students focusing on Sustainable Infrastructure take these courses.

CEE 267P Life Cycle Assessment Methods

[\(Outlines\)](#)

Catalog Description: Introduction and application of life cycle assessment methods for characterizing resource consumption and environmental emissions of products and civil infrastructure systems. Life cycle inventory development, system boundaries and scoping, calculation of environmental impact indicators.

CEE 268P Green Building Design

Catalog Description: Application of life cycle assessment methods to green and sustainable building design. Overview and application of building sustainability rating and certification systems using the LEED framework. Assessment and comparison of different building types.

CEE 269P Organizational Pollutant Emissions Accounting

Catalog Description: Application of life cycle assessment methods to account for emissions from the supply chain of products and infrastructure systems. Calculation and proper interpretation of Scope 1, 2, and 3 emissions categories and emissions footprint metrics.

MEng CEE, *Data Science in Civil and Envir. Eng.* Core Courses

MEng CEE students focusing on Data Science in Civil and Environmental Eng. take these courses.

CEE 2xxP-A Intro. to Data Science Programming and Optimization

([Outlines](#))

Catalog Description: Basics of object-oriented programming; data analysis using scientific programming packages; best programming practices; civil and environmental engineering analysis and design of linear systems; introduction to the analysis and design of non-linear systems in civil engineering.

CEE 2xxP-B Data Analytics for Civil Engineers

Catalog Description: Quantitative research methods and statistical techniques for analyzing and viewing civil and environmental engineering data. Descriptive statistics, hypothesis testing, linear and logical regression, clustering and introduction to machine learning.

MEng CEE, *Data Science in Civil and Envir. Eng.* Electives

MEng CEE students focusing on Data Science in Civil and Environmental Eng. can take these courses.

CEE 2xxP Data Analytics for Building Energy Operations Optimization

[\(Outlines\)](#)

Catalog Description: Application of data science and machine learning techniques to improving the operations of commercial building energy management systems. Investigate opportunities for improving system visibility, energy efficiency, reducing operational emissions, and energy costs.

CEE 2xxP Data Analytics for Flexible Electricity Distribution Systems

Catalog Description: Application of data science and machine learning techniques to improving the management of power flow and resilience of electricity distribution systems with increasing levels of distributed electricity generation resources, loads, and storage.

CEE 214 GIS for Civil and Environmental Engineering

Catalog Description: Explore Geographic Information Systems' applications in civil and environmental engineering, covering data formats, queries, spatial analysis, cartography, and GIS models. Learn through examples from environmental science, hydrology, weather, natural hazards, urban development, and transportation.

CEE 291 Remote Sensing of the Environment

Catalog Description: Learn remote sensing principles and their hydrological applications, including sensor systems, image processing, classification, and data science methods for image analysis. Explore examples of hydrologic processes like precipitation, soil moisture, and vegetation through remote sensing.

CEE MEng Electives by Area ([Outlines](#))

Structural Engineering Area

- CEE 231** - Foundation Engineering
- CEE 247** - Structural Dynamics
- CEE 250** - Finite Element Method in Structural Engineering
- CEE 254** - Advanced Reinforced Concrete Behavior & Design
- CEE 255** - Advanced Structural Steel Design

Transportation Engineering Area

- CEE 225P** - Sustainable Transportation.
- CEE 227P** - Transportation Policy and Technology
- CEE 230P** - Smart Cities

Water Resources Engineering Area

- CEE 163/263P** - Wastewater Treatment Process Design.
- CEE 269** - Beach Dynamics
- CEE 270** - Flood Risk and Modeling

Environmental Engineering Area

- CEE 1xx/2xxP** - Fundamentals of Sustainable Engineering
- CEE 166/266P** - Biological Processes for Bioremediation
- CEE 263A** - Advanced Biological Processes
- CEE 264** - Carbon and Energy Footprint Analysis of Water.