# Program of Study: Highway Construction Engineer

NNTW National Network for the Transportation Workforce

## PE – Professional Engineer

While each state licensing board has its own laws regarding engineering licensure, there is a general three-step process for licensure candidates. PE candidates must possess a degree accredited by EAC or ABET. They must take two exams, the Fundamentals of Engineering (FE) exam and the Principles and Practice of Engineering (PE) exam. Most states require four years of acceptable, progressive, and verifiable work experience in the industry. Once students pass the FE exam, they earn an Engineering in Training certificate or an Engineering Intern (EI) certificate depending on the certifying organization.

Year 5-6

## Master's Degree in Civil Engineering (Construction Project Management Emphasis)

**Year 6**: Students choose specific transportation engineering electives to round out their skill set. Examples include project management, contract management, safety management, and cost management.

**Year 5**: During the first year, students take core courses.

**Structural Design Courses**
Operating and Managing a Construction Organization
Negotiation & Dispute Resolution
Legal Principles & Practices
Construction Financial & Cost Control
Project Management
Construction Safety Management
Construction Equipment
Construction Productivity Analysis
Construction Contract Management
Linear Scheduling
Project Management
Labor Management
Occupational Health and Safety

Experiential learning includes internships, externships, co-ops and fieldwork

Year 3-4

## Bachelor's Degree in Civil Engineering (Construction and Transportation Emphasis)

**Year 3 & 4**: Students fulfill internship or co-op and fieldwork requirements. Elective courses that complement construction engineering include quality assurance, estimating and scheduling, electrical and mechanical systems, construction management, and construction operations analysis.

**Year 1 & 2**: Students take several engineering courses to build a strong technical background.

**GE Courses**
Chemistry, Geology, Calculus, Differential Equations, Statistics, Liberal Arts, and Communications

**Civil Engineering Required Courses**
Fluid Mechanics, Environmental Engineering, Soil Mechanics, Internship, and Senior Capstone Design

**Construction-Related Courses**
Structural Analysis
Foundation Design
Quality Assurance
Estimating and Scheduling
Materials for Constructed Facilities
Construction Project Management
Electrical and Mechanical Systems
Construction Operations Analysis

Experiential learning includes internships, externships, co-ops and fieldwork

Year 1-2

## Associate Degree in Civil Engineering Technology

**Year 2**: Students continue to take general education courses and technical courses that can prepare them for a position as a technologist. Those intending to transfer to a 4-year program will take additional mathematics courses.

**Year 1**: Students are required to take general education courses interspersed with technical coursework. Certifications are built into the curriculum.

**GE Courses**
English Composition and Oral Comm.
Intro to Psychology/Conflict Resolution
Trigonometry & Algebra w/Applications
Physics
Statics
Economics

**Construction-Related Courses**
Construction Planning and Scheduling
Materials & Construction Method
Construction Documentation
Construction Estimating & Bidding
Sustainable Construction Practices
AutoCAD for Construction Science
Soil and Materials Testing
Introduction to Structural Design
Construction Project Management
3D CAD: Digital Terrain Modeling
3D CAD: Building Information Modeling
Surveying and GPS Fundamentals
Surveying–Construction/Route/Highway
Capstone: CET–Highway Technology

Year 0

## High School Diploma

Transportation-related career academies.

U.S. Department of Transportation Federal Highway Administration

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