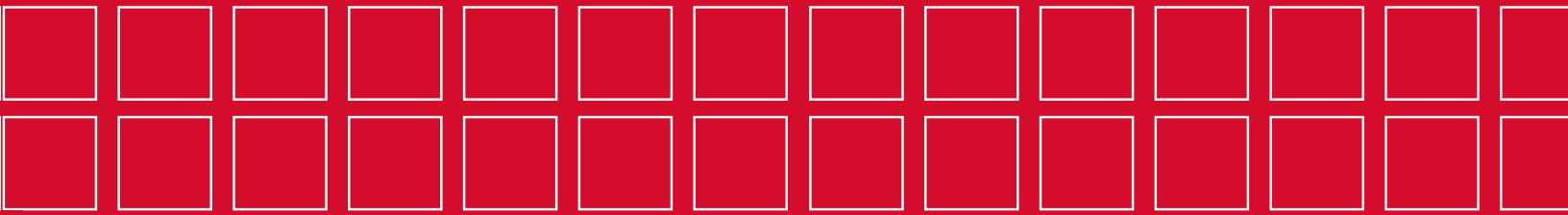


**NC STATE** Engineering

# CONSTRUCTION ENGINEERING

## Undergraduate Degree Program

*Department of Civil, Construction, and Environmental Engineering*





Linn Cove, NC, viaduct (Courtesy Figg Engineering)

## CAREERS IN CONSTRUCTION ENGINEERING

Graduates of the Construction Engineering (CON) degree program design and manage construction processes that create living and working environments such as office buildings, industrial buildings, airports, housing, roads, bridges, utilities, and dams. When you ask top managers in construction and engineering firms why they chose this career, you can hear the excitement of the construction industry in their responses. Some say they like to conceive an idea and then engineer and manage it through to reality. Others say that they like the combination of computerized planning, process design, cost engineering and scheduling with the gratification of seeing a job well done. Graduates of this degree program enjoy a wide range of opportunities to apply their technical knowledge with tremendous variety in the day-to-day work. Some choose design, planning, or financial management positions working in an office environment, while others prefer to direct field operations or some combination of the above.

Since no two projects are exactly alike, the practicing construction engineer/manager is always confronted with new and challenging opportunities. The education offered by the program has broad appeal since it combines engineering with management fundamentals. The depth of technical knowledge and breadth of expertise, coupled with management skills, can often lead to rapid promotion and advancement within an organization. Many employers have trouble finding enough qualified men and women to fill the positions available.

With an accredited engineering degree, graduates are on track in their pursuit of a Professional Engineering license, a necessity not only for professional practice, but also for many positions in local, state, and federal government. Obtaining a contractor's license is also a goal that many graduates pursue early in their careers. Since construction is done everywhere people live, graduates can often match their family and geographical location needs with an employer. Some companies operate only in a local area, some operate in many states, and for those seeking adventure some operate in many countries.

Michael B. Gwyn (B.S. 1980, Master of Engineering 1994) (President, Benham, a Haskell Co.)

"N.C. State will always be a special place for me. In addition to getting an outstanding academic education, the construction engineering program gave me an opportunity to develop leadership and management skills that I know have helped me throughout my career. It was this foundation that gave me the opportunity to work on and deliver challenging projects all over the world for the last 35 plus years. N.C. State and construction engineering is where it began."

Heather Denny (B.S. 1995) (President and CEO, McDonald York Building Company)

"The construction engineering degree from NC State not only provided me with a strong foundation of engineering principles to analyze and solve problems but also learn important leadership skills through group projects and involvement in student organizations — this education prepared me to build a career in leading and growing a successful construction company."

## CONSTRUCTION ENGINEERING DEGREE PROGRAM

A specialty in construction engineering was first offered at NC State within the civil engineering degree in the 1920's. In the late 1940's, a separate degree was established that evolved to the first accredited construction degree in the United States in 1954. Over the years, the program has maintained a close relationship with industry. The Construction Engineering degree prepares qualified graduates for graduate study specializing in construction engineering and management. In meeting rigorous engineering accreditation requirements, the degree serves as a long-term foundation for a construction career in a time of rapidly changing technology.

## CONSTRUCTION ENGINEERING CURRICULUM REQUIREMENTS

The Curriculum objective is to prepare individuals for a professional career in construction engineering and for continued learning through graduate education or self-study. Topical areas include:

- **General studies and Communications** – Academic writing and research, computing environments, computer science, professional communications, physical education
- **Mathematics** - Analytic geometry and calculus, probability and statistics, numerical applications to differential equations
- **Science** - Chemistry, physics, and geology or biosciences



- **Humanities and Social Sciences** - Electives from literature, history, political science, psychology, sociology, religion, anthropology, etc.
- **Engineering Management and Applications** - Economics, engineering economics, construction law, accounting or business, planning, cost estimating, cost control and construction engineering projects
- **Engineering Fundamentals** - Introduction to engineering, engineering graphics, statics, solid mechanics, engineering materials, construction engineering, hydraulics, and thermodynamics or electrical circuits
- **Construction Engineering** - Surveying and geomatics, construction materials, construction equipment and methods, soils and foundations, building construction, concrete design, steel design, and building mechanical and electrical systems, structural analysis, hydrology or traffic engineering

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- **128 hrs.** Total B.S. Credit Hour Requirements

## STARTING AND CAREER ADVANCEMENT POSITIONS

Graduates fill positions in construction companies, engineering consulting firms, government agencies, and large corporations. The position usually involves either the planning, design and management of the construction process for a general, specialty or mechanical contractor or the coordination, inspection, and management of design, contracts, or facilities for a business, industry, or government owner.

- **Field engineer**  
Implements and coordinates engineered construction processes.
- **Estimator**  
Develops itemized costs and budgets for design and construction based upon knowledge and predesign of operations, materials, and resource requirements.
- **Scheduling engineer**  
Designs and monitors the plan for timing and sequence of construction operations.
- **Project engineer**  
Designs all or part of the project construction process, coordinates construction engineering to accomplish the overall objectives of the facility design team.
- **Project manager**  
Oversees all aspects of a project, coordinates subcontractors, provides primary contact to the client as well as to the company's or agency's leaders.
- **Chief/senior/principal engineer, estimator, project manager**  
Oversees operations in designated areas related to multiple projects.
- **Division head or vice president, senior vice president, president, chief executive officer**  
Manages overall company or agency operations.

Career development also involves becoming active in support of the profession. Through membership in construction professional societies and industry associations, individuals continue their lifelong learning and professional growth and become recognized as leaders.



Construction engineering students visit Panama Canal expansion.

## GAINING EXPERIENCE PRIOR TO GRADUATION

Summer internships and co-operative education jobs are two methods that can give students a better understanding of career direction and a resume of experience attractive to employers upon graduation. It is often possible to find summer internships in the home community. Many contractors and construction-related organizations seek students for summer employment through the Construction Engineering Program and the University Career Center. The University Co-op Program structures the plan of study over one additional year to allow semester/summers of full-time study to be alternated with semester/summers of full-time work. Students are matched with employers in their field.



## ADMISSION AND FINANCIAL AID

Explore the admissions process and find information concerning freshman scholarships and need-based financial aid at [www.admissions.ncsu.edu](http://www.admissions.ncsu.edu) and [www.financialaid.ncsu.edu](http://www.financialaid.ncsu.edu). For other questions, contact

**Undergraduate Admission Office**  
**Campus Box 7103**  
**North Carolina State University**  
**Raleigh, NC 27695-7103**  
**Phone: 919.515.2434**  
**Fax: 919.515.5039**

Through the generosity of industry and program alumni, additional scholarships are available on a competitive basis to students after matriculation into the Construction Engineering major.

## ADDITIONAL INFORMATION

Explore the University's and Department's home pages at [www.ncsu.edu](http://www.ncsu.edu) and [www.ccee.ncsu.edu](http://www.ccee.ncsu.edu). For other questions, contact

**Construction Engineering Program**  
**Department of Civil, Construction, and Environmental Engineering**  
**Campus Box 7908**  
**North Carolina State University**  
**Raleigh, NC 27695-7908**

*North Carolina State University is committed to equality of educational opportunity and does not discriminate against applicants, students, or employees based on race, color, national origin, religion, sex, sexual orientation, age, or disability. NC State University commits itself to positive action to secure equal opportunity regardless of those characteristics.*