



## DISCIPLINE DESCRIPTION

# CIVIL, ENVIRONMENTAL, AND CONSTRUCTION ENGINEERING

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### ACTIVE TEACHING DISCIPLINES

For administrative use only; please do *not* edit federal NCES information below.

CIP Code	Title	Definition
14.0101	Engineering, General.	A program that generally prepares individuals to apply mathematical and scientific principles to solve a wide variety of practical problems in industry, social organization, public works, and commerce. Includes instruction in undifferentiated and individualized programs in engineering.
14.0801	Civil Engineering, General.	A program that generally prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of structural, load-bearing, material moving, transportation, water resource, and material control systems; and environmental safety measures.
14.1401	Environmental/Environmental Health Engineering.	A program that prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of systems for controlling contained living environments and for monitoring and controlling factors in the external natural environment, including pollution control, waste and hazardous material disposal, health and safety protection, conservation, life support, and requirements for protection of special materials and related work environments.
14.3301	Construction Engineering.	A program that prepares individuals to apply scientific, mathematical, and management principles to the planning, design, and building of facilities and structures. Includes instruction in civil engineering, structural principles, site analysis, computer-assisted design, geology, evaluation and testing, materials, contracting, project management, graphic communications, and applicable laws and regulations.

Note: More information on the National Center for Education Statistics (NCES) Classification of Instructional Programs (CIP) taxonomy is available at <https://nces.ed.gov/ipeds/cipcode/>.

The qualifications described below represent commonly accepted good practices for teaching in the discipline(s) represented in the unit.<sup>1</sup>

## Section 1. General description of the unit, including academic programs and course offerings<sup>2</sup>

The Department of Civil, Environmental, and Construction Engineering offers a full range of undergraduate and graduate programs. The department's educational and research program in civil engineering reflects the broad nature of the field, which encompasses the design, construction, operation, and enhancement of the infrastructure of society. The educational program includes coursework in applied mathematics, engineering mechanics, environmental engineering, geotechnical engineering and foundations, materials and measurements, structural analysis and design, traffic engineering, transportation planning and operations, and water resources engineering. The baccalaureate degree program is accredited by the Engineering Accreditation Commission of ABET, and the master's degree program offers several options for specialization in such subdisciplines as smart cities, structural and geotechnical engineering, transportation systems engineering, and water resources engineering. The department also offers several service courses in engineering analysis to engineering majors in other departments.

The environmental engineering program focuses on protecting local, regional, and global environments from the detrimental effects of natural and human activities. The educational program includes coursework in engineering mechanics, hydraulics and geotechnical engineering, drinking water treatment, wastewater treatment, solid waste and sustainable resource management, atmospheric pollution control and hazardous waste control, and construction engineering. The baccalaureate degree program is accredited by the Engineering Accreditation Commission of ABET. The environmental engineering program is grounded in the biological and physical sciences, which provides students with many opportunities for interdisciplinary research.

The construction industry is one of the largest employers in the United States, comprising such professionals as engineers, contractors, architects, real estate developers, construction laborers, material and equipment vendors, financial and insurance agents, lawyers, and government officials. Upper-level construction engineering coursework covers such industry basics as estimating, scheduling and project control principles, construction methods, construction equipment, mechanical and electrical systems for buildings, project management, accounting, labor resource management, and principles of organizational behavior. The baccalaureate degree program is accredited by the Engineering Accreditation Commission of ABET. The interdisciplinary nature of the program offers a mix of essential technical, managerial, and business courses for a successful career in the construction industry.

## Section 2. Qualifying degree(s) for each discipline taught in the unit<sup>3</sup>

*A terminal degree in the teaching discipline qualifies a faculty member to teach throughout the broad scope of the teaching discipline at the undergraduate and graduate levels.<sup>4</sup>*

The doctoral degree (e.g., PhD) in any of the department's primary disciplinary areas (i.e., civil engineering, construction engineering, environmental engineering) represents the terminal degree in that discipline.

## Section 3. Broadly related discipline(s) for each discipline taught in the unit

*Specialization qualifies a faculty member to teach throughout the broad scope of the teaching discipline (typically five or more courses on distinct topics).*

Faculty members with degrees in any of the following disciplines may be qualified to teach throughout the broad scope of the department's offerings, according to the level of their degree (master's for undergraduate, doctoral for graduate):

- Chemical engineering
- Computer engineering
- Electrical and electronics engineering
- Engineering mechanics
- Environmental science
- Geotechnical engineering
- Structural engineering

- Transportation engineering
- Water resources engineering

#### **Section 4. Selectively related discipline(s) for each discipline taught in the unit**

*Specialization qualifies a faculty member to teach a restricted set of courses in the teaching discipline (typically four or fewer courses on distinct topics).*

The department offers courses in mechanical and electrical systems for buildings. Faculty members with degrees in mechanical engineering, aerospace engineering, and engineering science and mechanics at the appropriate level (master's for undergraduate, doctoral for graduate) may be qualified to teach courses in mechanical systems. Likewise, faculty members with degrees in electrical engineering at the appropriate level (master's for undergraduate, doctoral for graduate) may be qualified to teach courses in electrical systems.

The department offers CGN3700C: Civil Engineering Measurements, which includes surveying, GIS, GPS, and remote sensing, as part of the required course work for the civil and construction engineering programs and as an elective for the environmental engineering program. Appropriate qualifications to teach this course include a master's degree in geodetic science and surveying or a master's degree in civil engineering or a subspecialty thereof.

#### **Section 5. Justification for use of faculty members with “other” teaching qualifications and additional information<sup>5</sup>**

The department considers other teaching qualifications in conjunction with or in lieu of academic credentials on a case-by-case basis. This is acceptable in special cases in which evidence of a faculty member's exceptional industry experience, research, or other qualifications can be documented, and in which those qualifications are directly applicable to the course or courses being taught.

1. The unit chair or director, in consultation with unit faculty members, is responsible for identifying and articulating commonly accepted good practices in each of the unit's teaching disciplines and for providing appropriate justification as needed. In the case of an emerging discipline for which common collegiate practice has not yet been established, a compelling case must be made, as necessary, to substantiate the claims presented.
2. Please provide a general description of the unit's course and program offerings at the undergraduate and graduate levels (e.g., degree and certificate programs, minors, unit contributions to interdisciplinary core courses). This section may also be used to provide other pertinent information about the unit and the discipline(s) it represents (e.g., discipline accreditation, faculty research emphases).
3. For each discipline taught in the unit, please list those degrees that are regarded by the respective disciplinary community as terminal degrees in the discipline and thus qualify a faculty member to teach throughout the broad scope of that discipline at the undergraduate and graduate levels. In most fields, a terminal degree is the commonly accepted highest degree in the given field of study. In such instances, the terminal degree is usually considered to be the academic (or research) doctorate (e.g., Doctor of Philosophy). However, some academic fields have, through custom, recognized terminal degrees that are not doctorates (e.g., Master of Fine Arts). Note that terminal degrees in other disciplines may also be appropriate for teaching in the discipline, but such credentials should be listed as broadly or selectively related degrees, as appropriate.
4. A nonterminal master's degree in the teaching discipline qualifies a faculty member to teach throughout the broad scope of the teaching discipline at the undergraduate level but not at the graduate level.
5. Please use this section to provide justification that helps to make the case for special circumstances that apply to the unit, including the use of faculty members qualified to teach by “other” means. Typically, the statements provided in this section should be of a general nature and should not address specific individuals. (Justification for specific individuals is typically handled separately during the teaching certification process.) Please cite appropriate authorities as needed to justify the unit's practices (e.g., discipline accreditation guidelines, governmental regulations).

When a faculty member cannot be qualified to teach on the basis of academic credentials (i.e., degrees, coursework) alone, qualifications other than academic credentials (or combined with academic credentials) that are appropriate for teaching particular courses may be taken into consideration. Such consideration of other teaching qualifications in conjunction with or in lieu of academic credentials must be made on a case-

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by-case basis. These cases should be exceptional, and the evidence provided of other demonstrated competencies and achievements must be compelling. They should also show significant evidence of professional progress as related to the faculty member's teaching assignment.