DISCIPLINE DESCRIPTION

MECHANICAL AND AEROSPACE ENGINEERING

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.
14.0201	Aerospace, Aeronautical, and Astronautical/Space Engineering, General.	A program that prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of aircraft, missiles, space vehicles, and their systems; applied research on flight and orbital characteristics; and the development of systems and procedures for the launching, guidance, and control of air and space vehicles.
14.0501	Bioengineering and Biomedical Engineering.	A program that prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of biomedical and health systems and products such as integrated biomedical systems, instrumentation, medical information systems, artificial organs and prostheses, and health management and care delivery systems.
14.1901	Mechanical Engineering.	A program that prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of physical systems used in manufacturing and end-product systems used for specific uses, including machine tools, jigs and other manufacturing equipment; stationary power units and appliances; engines; self-propelled vehicles; housings and containers; hydraulic and electric systems for controlling movement; and the integration of computers and remote control with operating systems.

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.[1]

Section 1. General description of the unit, including academic programs and course offerings[2]

The Department of Mechanical and Aerospace Engineering offers baccalaureate, master's, and doctoral degree programs in aerospace engineering and mechanical engineering and master's and doctoral degree programs in biomedical engineering.

The interdisciplinary nature of the department's academic programs means that, at each level, they may share a number of courses. It is often appropriate, therefore, for a faculty member with primary expertise in one of the disciplines listed above to teach courses in one or more of the other disciplines represented in the department. Indeed, faculty members with expertise in other engineering disciplines may also be qualified to teach courses in the department. For example, the instrumentation and characterization techniques used by mechanical and aerospace engineers are also commonly used by materials scientists and engineers, as well as by chemists and physicists. In addition, research and pedagogy in the subdiscipline of microelectromechanical systems routinely requires the combined expertise of materials scientists and mechanical and electronics engineers.

All engineers, by virtue of their education and training, are applied mathematicians and scientists; it may be appropriate, therefore, for faculty members whose primary expertise is in physics, mathematics, or medicine to teach engineering courses whose content requires such expertise.

The department benefits from close ties with the university's Advanced Materials Processing and Analysis Center, the Institute for Simulation and Training, the UCF College of Medicine, and the Department of Electrical and Computer Engineering.

Section 2. Qualifying degree(s) for each discipline taught in the unit[3]

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.[4]

Aerospace Engineering
- PhD in aerospace, aeronautical and astronautical/space engineering

Biomedical Engineering
- PhD in bioengineering and biomedical engineering

Mechanical Engineering
- PhD in mechanical engineering

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).

Aerospace Engineering
- Applied Mathematics
- Civil engineering
- Electrical, electronics, and communications engineering
- Engineering mechanics
- Mechanical engineering

Biomedical Engineering
- Applied mathematics
- Biological and biomedical sciences
- Chemical engineering

- Chemistry
- Computer engineering
- Electrical, electronics, and communications engineering
- Engineering mechanics
- Industrial engineering
- Materials engineering
- Mechanical engineering
- Metallurgical engineering

Mechanical Engineering

- Aerospace, aeronautical, and astronautical/space engineering
- Applied mathematics
- Chemical engineering
- Civil engineering
- Electrical, electronics, and communications engineering
- Engineering mechanics
- Industrial engineering
- Manufacturing engineering
- Materials engineering
- Metallurgical engineering
- Nuclear 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).

Aerospace Engineering

- Astronomy and astrophysics
- Chemistry
- Computer engineering
- Computer science
- Mathematics
- Modeling, virtual environments, and simulation
- Physics

Biomedical Engineering

- Mathematics
- Medicine
- Modeling, virtual environments, and simulation
- Physics

Mechanical Engineering

- Chemistry
- Computer engineering
- Computer science
- Mathematics
- Modeling, virtual environments, and simulation
- Physics

Section 5. Justification for use of faculty members with "other" teaching qualifications and additional information[5]

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. For example, certain courses that emphasizes practical industry knowledge may be taught by faculty members with a professional engineering license or extensive industrial experience in research and development in the particular topics covered by the course.

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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-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.