UNIVERSITY OF CENTRAL FLORIDA

Faculty Qualifications: Discipine Description

Materials Science and Engineering

ACTIVE TEACHING DISCIPLINES		
For Administrative Use Only – *Please do <u>not</u> edit federal NCES information below*		
CIP Code	**Description**	**NCES Definition** For more information on the NCES CIP taxonomy, see http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55
14.0801	Materials Engineering	A program that prepares individuals to apply mathematical and materials science principles to the design, development, and operational evaluation of materials and related processes used in manufacturing in a wide variety of settings; the synthesis of new industrial materials, including marrying and bonding composites; analysis of materials requirements and specifications; and related problems of system design dependent on materials factors.
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.

The qualifications described below represent commonly accepted good practices for teaching in the discipline(s) included in this unit. **[1]**

Please provide a general description of unit, including programs and course offerings [2]

The Materials Science and Engineering (MSE) Department offers these programs:

- Materials Science & Engineering MS
- Materials Science & Engineering PhD

Additionally, MSE anticipates proposing a baccalaureate program (BSMSE) in the near future.

Although there is no BS Materials Science and Engineering program, there is a MS degree in Materials Science and Engineering. Generally, the EMA prefix designates courses in the Materials Engineering program. However, MSE faculty also contributes to the College of Engineering and Computer Science by teaching courses, including undergraduate courses, with

the EMA and EGN prefixes.

Given the interdisciplinary nature of the Materials Science and Engineering discipline, it is appropriate to have faculty whose primary unit is another academic department or a research center teach MSE courses. The MSE department benefits from close ties with the Advanced Materials Processing and Analysis Center (AMPAC), the Center for Research and Education in Optics and Lasers (CREOL), the NanoScience Technology Center (NSTC), the Florida Solar Energy Center (FSEC) and the Electrical and Computer Engineering Division of the Department of Electrical Engineering and Computer Science.

Terminal degree(s) for each discipline taught in the unit [3]

A terminal degree in the teaching discipline qualifies a person to teach throughout the broad scope of the teaching discipline at the undergraduate and graduate levels. **[4]**

A terminal degree in the teaching discipline (Materials Science and Engineering) qualifies a person to teach throughout the broad scope *of the teaching discipline at the undergraduate and graduate levels.*

- PhD Materials Engineering
- PhD Materials Science and Engineering
- PhD Metallurgical Engineering

Broadly related discipline(s) for each discipline taught in the department

Specialization qualifies a person to teach throughout the broad scope of teaching discipline (approximately five or more courses on distinct topics)

- Physics
- Chemistry
- Optics
- Natural Science
- Materials Science
- Physical Metallurgy
- Engineering
- Aerospace Engineering
- Civil Engineering
- Nuclear Engineering
- Medical Engineering
- Electrical Engineering
- Chemical Engineering

- Mechanical Engineering
- Electronic Engineering
- Biomedical/Bio Engineering
- Biology

Selectively related discipline(s) for each discipline taught in the department

Specialization does not qualify a person to teach distinct topics throughout the broad scope of the teaching discipline but does qualify to teach a more restrictive set of courses in the discipline (approximately four or fewer courses on distinct topics)

- Design Engineering
- Manufacturing Engineering

In addition, those fitting the following broad definition may be qualified to teach at the undergraduate and graduate level in MSE.

- PhD or another Doctoral degree in a closely related Engineering or Science Discipline with a significant research component in the form of a dissertation.

Those fitting the following criterion may be qualified to teach at the undergraduate level in MSE.

- A non-terminal MS degree or a Doctor of Engineering without a dissertation in a closely related Engineering or Science Discipline.

Justification for use of faculty with 'other' teaching qualifications and additional faculty teaching qualifications information [5] [6]

Certain courses that emphasizes real life, practical engineering aspects may be taught by instructors with a Professional Engineering license and/or extensive industrial experience in research and development in the particular topics covered by the course.

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[1] The unit chair/director, in consultation with unit faculty, has responsibility for identifying and articulating commonly accepted good practices in each teaching discipline taught in the unit 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 provided as necessary to substantiate the claims made.

[2] Please provide a general description of the unit course and program offerings at the undergraduate and graduate levels (e.g., degree and certificate programs, minors, departmental contribution 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] List those degrees for each discipline taught in the unit 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 both 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, Master of Social Work). Note that terminal degrees from other disciplines may be appropriate for teaching in the discipline as well, but such credentials should be listed as broadly or selectively related degrees, as appropriate.

[4] A non-terminal master's degree in the teaching discipline qualifies a person to teach throughout the broad scope of the teaching discipline at the undergraduate level, 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 your unit including the use of faculty qualified to teach by 'other' qualifications and other special situations. Typically the statements provided in this section should be of a general nature, and not address specific individuals. (Justification for specific individuals is typically handled separately during the teaching certification process.) As appropriate, please cite to appropriate authorities to justify departmental practices (e.g., discipline accreditation guidelines, state regulations).

[6] When a faculty member cannot be qualified to teach on the basis of academic credentials (degree(s) and course work) alone, qualifications other than academic credentials (or combined with credentials) may be appropriate for teaching particular courses. Consideration of other teaching qualifications either in conjunction with or in lieu of academic credentials must be made on a case-by-case basis. Such cases should be exceptional and the evidence of other demonstrated competencies and achievements provided must be compelling. It should also show substantial and significant evidence of professional progress as related to the faculty member's teaching assignment.