Criterion 3. Program Outcomes and Assessment

- an ability to design and conduct experiments, as well as to analyze and interpret data

- an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

Criterion 4
Professional Component

one and one-half years of engineering topics, consisting of engineering sciences and engineering design appropriate to the student's field of study. The engineering sciences have their roots in mathematics and basic sciences but carry knowledge further toward creative application. These studies provide a bridge between mathematics and basic sciences on the one hand and engineering practice on the other.

Engineering design is the process of devising a system, component, or process to meet desired needs. It is a decision-making process (often iterative), in which the basic sciences, mathematics, and the engineering sciences are applied to convert resources optimally to meet these stated needs.

Students must be prepared for engineering practice through the curriculum culminating in a major design experience based on the knowledge and skills acquired in earlier course work and incorporating appropriate engineering standards and multiple realistic constraints.

PROGRAM CRITERIA FOR MATERIALS1, METALLURGICAL2, AND SIMILARLY NAMED ENGINEERING PROGRAMS

- 1. Curriculum
- The program must demonstrate that graduates have: the ability to apply advanced science (such as chemistry and physics) and engineering principles to materials systems implied by the program modifier, e.g., ceramics, metals, polymers, composite materials, etc.; an integrated understanding of the scientific and engineering principles underlying the four major elements of the field: structure, properties, processing, and performance related to material systems appropriate to the field; the ability to apply and integrate knowledge from each of the above four elements of the field to solve materials selection and design problems; the ability to utilize experimental, statistical and computational methods consistent with the goals of the program.

Key words

system, component, or process

through the curriculum culminating in a major design experience

the ability to apply and integrate knowledge from each of the above four elements of the field to solve materials selection and design problems

Broader definition!

1. Design, select and evaluate the application of materials for a specific application:
    - Failure analysis of a component and develop a solution.
    - Ceramic design competition
2. Reverse engineering of a component with the intent of designing a better component through selection of materials
3. Design, conduct and perform a project such as a senior thesis
4. Design Portfolio
    - Multiple experiences such as coop, internship, REU's etc
5. Design of microstructure for application
    - Heat treatment of an alloy to control properties for a specific application
    - Thin film deposition
6. Participation in a broad-based mutli- and interdisciplinary team project the outcome of which is not necessarily a materials component
    - Technology and management Program
    - Solar car design team
    - Engineers without borders

MSE
DESIGN

Professional activities of our graduates In their profession