

Criterion 3 Outcome Skills for Mechanical Engineering Program

Criterion 3A: Ability to apply knowledge of mathematics, science, and engineering

1. The student will be able to evaluate basic geometrical quantities and mathematical expressions.
2. The student will have knowledge of basic sciences and associated analysis techniques.
3. The student will be proficient with basic analyses associated with other disciplines.

Criterion 3B: Ability to design and conduct experiments analyze and interpret data

1. The student will be proficient with the selection and basic operation of common instrumentation used in engineering measurement.
2. The student will be able to design and conduct an experiment and compare the results to those predicted by an analytical model.
3. The student will be able to interpret and discuss the results.

Criterion 3C: Ability to design a sub-system component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

1. The student will be able to recognize a need and develop appropriate design specifications.
2. The student will be able to develop component, system, or process concept solutions based on above specifications.
3. The student will be able to use analysis to refine the design of a component, a system, or a process.
4. The student will be able to build a functional prototype and assess if it meets performance specifications.

Criterion 3D: Ability to function on multidisciplinary teams

1. The student will recognize the value of a broad skill set resulting from a multidisciplinary team.
2. The student will be able to communicate effectively with colleagues in other disciplines.
3. The student will be able to identify when problems occur due to poor interactions among team members and identify ways to improve team dynamics.

Criterion 3E: Ability to identify formulate and solve engineering problems

1. The student will be able to identify faulty products or processes and develop an engineering solution.
2. The student will be able to select appropriate models for analyzing a system.
3. The student will be able to analyze their models and interpret their results.

Criterion 3F: Understanding of professional and ethical responsibility

1. The student will have knowledge of ASME code of ethics.
2. The student will be able to identify health and safety concerns associated with their design.
3. The student will be able to identify situations with ethical concerns.

Criterion 3G: Ability to communicate effectively

1. The student will be able to write an effective memorandum, letter, abstract, and project report.
2. The student will be able to give a coherent and effective oral presentation.
3. The student will be able to critique writing samples and oral presentations and identify both strong points and weak points in grammar, clarity, and organization.

Criterion 3H: Broad education necessary to understand impact of engineering solutions in a global, economic, environmental, and societal context

1. The student will be aware of society's need for engineering solutions.
2. The student will be aware of the environmental and economic impact of their engineering solutions.
3. The student will be able to identify possible unintended negative global or societal consequences of proposed engineering solutions.

Criterion 3I: Recognize need for & ability to engage in life long learning

1. The student will be able to understand the limitations of their knowledge.
2. The student will be able to find and use appropriate technical resources.
3. The student will be able to identify their need for additional education.

Criterion 3J: Knowledge of contemporary issues

1. The student will be able to identify important contemporary regional, national, or global issues.
2. The student will be able to discuss the historical roots of important contemporary regional, national, or local issues.
3. The student will be able to discuss ways engineers are contributing or might contribute to the solution of regional, national, or global problems.

Criterion 3K: Ability to use techniques, skills and modern engineering tools necessary for engineering practice.

1. The student will be proficient with computer-based design simulation and analysis tools.
2. The student will be able to perform parametric studies of proposed designs.
3. The student will be able to develop a computer algorithm to solve a numerical problem.