

# Bachelor of Science in Mechanical Engineering

## Undergraduate

### *Expanded Statement of Institutional Purpose*

#### **Institutional Mission Reference**

The B.S. degree program in Mechanical Engineering offers a high quality degree program that meets national standards of excellence. It is a significant component of the University's commitment to science, engineering, and technology, particularly in fields of major importance to the region. The program provides the skills and knowledge unique to Mechanical Engineering that support the engineering profession in meeting the growing needs of the region and the nation. Simultaneously, the program comprises the general education components that yield a well-rounded graduate who is aware of societal needs and issues. The program faculty is committed to the highest quality of teaching and discovery of new knowledge.

#### **Institutional Goal(s) Supported**

The B.S. degree program in Mechanical Engineering supports the University missions and goals of (a) quality undergraduate programs, (b) sound general education program, (c) serving the local community through applied research and development, and (d) life-long learning. The major strategic goals supported by the department are (1) Increase academic quality, (2) create an agenda and climate to encourage research and creative activity, (3) improve the quality and productivity of graduate programs, (4) make the University sensitive to the people and the needs of the region and world around it.

### *Intended (Student) Outcomes for your program, Methods for Assessment, and Criteria for Success*

**Intended Outcome 1:** Students who qualify for graduation will be proficient in mathematics through differential equations, probability and statistics, calculus-based physics, general chemistry, and engineering science and have the ability to apply knowledge in these areas to

mechanical engineering problems.

**Method for Assessing Outcome 1 and Criterion for Success:**

This outcome is assessed by individual course outcome assessment, senior exit survey, and the alumni survey. At a minimum program will receive ratings of at least 4.5 on the 1-7 (1=Not at All, 4=Moderate, 7=Extreme) scale used by the assessment instruments.

**Intended Outcome 2:** Students who qualify for graduation will have the ability to design and conduct experiments and to critically analyze and interpret data in various mechanical engineering fields.

**Method for Assessing Outcome 2 and Criterion for Success:**

This outcome is assessed by individual course outcome assessment, senior exit survey, and the alumni survey. At a minimum program will receive ratings of at least 4.5 on the 1-7 scale used by the assessment instruments.

**Intended Outcome 3:** Students who qualify for graduation will be able to develop design criteria to meet desired needs and to design a mechanical engineering system, component, or a process satisfying these criteria.

**Method for Assessing Outcome 3 and Criterion for Success:**

This outcome is assessed by individual course outcome assessment, senior exit survey, and the alumni survey. At a minimum program will receive ratings of at least 4.5 on the 1-7 scale used by the assessment instruments.

**Intended Outcome 4:** Students who qualify for graduation will have the ability to function on multi-disciplinary teams.

**Method for Assessing Outcome 4 and Criterion for Success:**

This outcome is assessed by individual course outcome assessment, senior exit survey, and the alumni survey. At a minimum program will receive ratings of at least 4.5 on the 1-7 scale used by the assessment instruments.

**Intended Outcome 5:** Students who qualify for graduation will

be able to identify and formulate an engineering problem, to collect and analyze relevant data, and to develop a solution.

**Method for Assessing Outcome 5 and Criterion for Success:**

This outcome is assessed by individual course outcome assessment, senior exit survey, and the alumni survey. At a minimum program will receive ratings of at least 4.5 on the 1-7 scale used by the assessment instruments.

**Intended Outcome 6:** Students who qualify for graduation will understand and appreciate professional and ethical responsibilities and professional practice issues such as procurement of work and bidding versus quality based selection processes.

**Method for Assessing Outcome 6 and Criterion for Success:**

This outcome is assessed by individual course outcome assessment, senior exit survey, and the alumni survey. At a minimum program will receive ratings of at least 4.5 on the 1-7 scale used by the assessment instruments.

**Intended Outcome 7:** Students who qualify for graduation will be able to effectively present ideas and technical material to diverse audiences in writing, visually, and verbally.

**Method for Assessing Outcome 7 and Criterion for Success:**

This outcome is assessed by individual course outcome assessment, senior exit survey, and the alumni survey. At a minimum program will receive ratings of at least 4.5 on the 1-7 scale used by the assessment instruments. It is also assessed by the University Exit Examination of Writing Proficiency which is required of all University graduates.

**Intended Outcome 8:** Students who qualify for graduation will have the broad education necessary to understand the impact of engineering solutions in a societal and global context.

**Method for Assessing Outcome 8 and Criterion for Success:**

This outcome is assessed by individual course outcome assessment, senior exit survey, and the alumni survey. At a minimum program will receive ratings of at least 4.5 on the

1-7 scale used by the assessment instruments.

**Intended Outcome 9:** Students who qualify for graduation will understand and appreciate the importance of professional licensure and commitment to life-long learning.

**Method for Assessing Outcome 9 and Criterion for Success:**  
This outcome is assessed by individual course outcome assessment, senior exit survey, and the alumni survey. At a minimum program will receive ratings of at least 4.5 on the 1-7 scale used by the assessment instruments.

**Intended Outcome 10:** Students who qualify for graduation will have knowledge of current issues and awareness of emerging technologies.

**Method for Assessing Outcome 10 and Criterion for Success:**  
This outcome is assessed by individual course outcome assessment, senior exit survey, and the alumni survey. At a minimum program will receive ratings of at least 4.5 on the 1-7 scale used by the assessment instruments.

**Intended Outcome 11:** Students who qualify for graduation will have an ability to use modern engineering techniques, skills, and tools including computer-based tools for mechanical engineering analysis and design.

**Methods of Assessment and Criterion for results:**  
This outcome is assessed by individual course outcome assessment, senior exit survey, and the alumni survey. At a minimum program will receive ratings of at least 4.5 on the 1-7 scale used by the assessment instruments.