

Mechanical Engineering Technology Manufacturing Concentration

Program Mission Statement

The mission of the Manufacturing Concentration in the Mechanical Engineering Technology program is to provide students with a quality education that will prepare them to pursue careers as engineering technicians in the manufacturing and service industries. This concentration emphasizes the application of high-tech production equipment, software and techniques to achieve cost savings and quality in the manufacturing, service and distribution industries. Hands-on, high-tech laboratories featuring computer-integrated manufacturing (CIM), automated storage and retrieval systems (ASRS), bar-coding, computer-aided design (CAD), computer facilities layout, computer-numerical controlled (CNC) machining centers, and programmable logic controlled (PLC) robots, are combined with instruction on modern production techniques. Graduates can find a variety of employment opportunities in the areas of facilities layout, process development, product development, quality control, technical sales, and warehousing.

TAC/ABET Engineering Technology Criteria

Program Educational Objectives and Program Outcomes must support TAC/ABET Engineering Technology criteria a-k:

- (a) an appropriate mastery of the knowledge, techniques, skills, and modern tools of their disciplines,
 - (b) an ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology,
 - (c) an ability to conduct, analyze, and interpret experiments and apply experimental results to improve processes,
 - (d) an ability to apply creativity in the design of systems, components or processes appropriate to program objectives,
 - (e) an ability to function effectively on teams,
 - (f) an ability to identify, analyze, and solve technical problems,
 - (g) an ability to communicate effectively,
 - (h) a recognition of the need for, and an ability to engage in lifelong learning,
 - (i) an ability to understand professional, ethical, and social responsibilities,
 - (j) a respect for diversity and knowledge of contemporary professional, societal, and global issues,
- and
- (k) a commitment to quality, timeliness, and continuous improvement.

Also, the Program Educational Objectives and Program Outcomes must support TAC/ABET Mechanical Engineering Technology criteria a, b and c:

(a) Technical expertise in a minimum of three subject areas chosen from – engineering materials, applied mechanics, applied fluid sciences, applied thermal sciences and fundamental electricity

(b) Technical expertise in manufacturing processes, mechanical design and computer-aided engineering graphics with added technical depth in at least one of these areas.

(c) Expertise in applied physics having an emphasis in applied mechanics plus inorganic chemistry, or, if program objectives do not require chemistry, added technical topics in physics appropriate to the program objectives.

Program Educational Objectives

Program Educational Objectives are based on student achievement 2-3 years after graduation. The Program Educational Objectives are:

- EO-1 To ensure graduates have the ability to communicate effectively.
- EO-2 To ensure graduates have a working knowledge in the areas of computer-aided-design (CAD), engineering materials, electro-mechanical devices, computer-numerical controlled (CNC) applications, statistical quality control, and computer integrated manufacturing.
- EO-3 To prepare graduates to obtain employment in the mechanical engineering-related areas of manufacturing, service and distribution industries.

Program Outcomes

The **Mechanical Engineering Technology – Manufacturing Concentration** student will have demonstrated the following attributes upon graduation:

- **PO-1** Communicate effectively through proper use of oral, written and graphic skills. Covers ABET criteria: a, c, f & g
- **PO-2** Knowledge of basic machining processes, metrology, and GD&T for manufacturing. Covers ABET criteria: a, b & g and specific TAC/ABET Mechanical Engineering Technology criteria: A (materials) & B (manufacturing processes).
- **PO-3** The ability to use Computer-Aided Design (CAD) software to create 2D mechanical drawings. Covers ABET criteria: a, b & g and TAC/ABET Mechanical Engineering Technology criteria: B (CAE graphics)
- **PO-4** The ability to use logic to construct computer programs for solving CNC applications. Covers ABET criteria: a, b, d, f & k and TAC/ABET Mechanical Engineering Technology criteria: B (manufacturing processes).

- **PO-5** The ability to layout an efficient production area and industrial facility using analytical techniques and Computer-Aided Design (CAD) software. Covers ABET criteria: a, b, c, d, f & k and TAC/ABET Mechanical Engineering Technology criteria: B (manufacturing processes/CAE graphics).
- **PO-6** A knowledge of basic statistical quality control concepts and their application for industry. Covers ABET criteria: a, b, c, d, f & k.
- **PO-7** A knowledge of automation and computer-integrated manufacturing methods for industry. Covers ABET criteria: a, b, c, d, f & k and TAC/ABET Mechanical Engineering Technology criteria: B (manufacturing processes).
- **PO-8** Knowledge of basic electrical circuits and electro-mechanical devices. Covers ABET criteria: a, b & f and TAC/ABET Mechanical Engineering Technology criteria: A (fundamental electricity) & C (physics).
- **PO-9** Solve technical problems using algebra and trigonometry. Covers ABET criteria: a, b & f
- **PO-10** Understand the importance of teamwork, lifelong learning, professional, ethical and social responsibility, respect for diversity, and commitment to quality, timeliness and continuous improvement. Covers ABET criteria: e, g, h, i, j & k.