Engineering Technology - Bachelor of Science in Applied Science

For more information please contact the Department of Engineering Technology in room 207 Phelps Hall, Hamilton campus, or by phone 513-785-1804.

This department offers Associate Degree programs in Electrical and Computer Engineering Technology and Mechanical Engineering Technology and baccalaureate completion degree programs. All programs are offered on the regional campuses in Hamilton and Middletown. The baccalaureate programs are only for students who have earned an associate degree. The associate degree programs are described in the Hamilton and Middletown chapter.

Educational Objectives
We consider program educational objectives as the general characteristics our graduates demonstrate to the workplace, graduate school, the military, or their endeavors after they leave Miami. We typically measure these characteristics initially at graduation by asking graduates if they feel that they have achieved these characteristics and then periodically thereafter through employer surveys, letters from graduates, advisory council, graduate school accomplishments, and surveys of graduates who have been out for a while. These characteristics should become most evident within the first few years after graduation.

The Engineering Technology Department’s graduates are able to:

• apply math and physics principles to the solution of engineering technical problems.
• use applied skills to identify, evaluate, and solve complex technical problems.
• use engineering computer software to facilitate engineering problem solving.
• function effectively in team-oriented activities.
• demonstrate the knowledge of expected standards of ethical and professional conduct.
• verbally communicate ideas.
• prepare well-written technical reports.

In addition, our graduates will have the necessary fundamentals to pursue life-long learning.

Program-Specific Educational Objectives
Electrical and Computer Engineering Technology (B.S.)
The ECET BS concentration produces graduates who:

• Are able to analyze and design complex electrical and computer components and systems.
• Are able to effectively and efficiently manage electrical and computer engineering projects.

• Are able to set-up experimental testing procedures and selectively utilize data to reinforce electrical and computer engineering concepts.

Electro-Mechanical Engineering Technology (B.S. Completion Program)
The EMET program produces graduates who:

• possess the ability to apply theoretical knowledge to solve engineering technology problems associated with instrumentation and control systems.
• are knowledgeable of modern applications in process control systems.

Mechanical Engineering Technology (B.S.)
The MET program produces graduates who:

• are able to analyze and design complex mechanical components and systems.
• are able to set up experimental testing procedures and selectively utilize data to reinforce engineering concepts.
• have a basic understanding of modern manufacturing methods used to facilitate the production of consumer products.
• are able to effectively and efficiently manage engineering projects (B.S. only).

Credit/No Credit Policy
All required engineering technology courses and prerequisite mathematics and statistics courses should be taken for a grade.

Program Requirements
(124 semester hours)

Electrical and Computer Concentration
The Engineering Technology baccalaureate degree (Electrical and Computer concentration) is a completion program for graduates of associate degree programs in electrical/electronics, electrical and computer, or similar engineering technology programs and for computer information technology or similar programs. The objective of this program is to allow students who possess an associate degree in these areas to complete the bachelor’s degree in approximately the equivalent of two years of full-time work.

Graduates are engineering technologists prepared to fill industrial positions in areas directly related to product design, process control, testing, manufacturing, sales, and service. Typical Electrical and Computer Engineering Technologist’s jobs include Communications Engineering, Electronics Engineering, Biomedical Engineering, Sales Engineering, Service Engineering, Controls Engineering, Software Engineering, System Design Engineering, Applications Engineering and R&D Technologist.

This program requires the completion of an Associate Degree from an accredited college or university in Electrical/Electronic, Electrical and Computer, or similar engineering technology program; or computer information technology or similar program.

• The following General Education and Technical courses are expected to have been taken within the Associate Degree’s with a minimum of 60 semester hours.
If an equivalent to any of these courses has not been completed already, they must be taken at Miami University to bridge the Associate Degree and Bachelor completion.

### Foundation Requirements (60 semester hours minimum)

General Education Courses from Associate Degree or as a Bridge to a Bachelor’s Completion:

- ECO 201 Principles of Microeconomics
- or ECO 202 Principles of Macroeconomics
- ENG 111 Composition and Rhetoric
- or ENG 313 Technical Writing
- MTH 151 Calculus I
- PHY 161 Physics for the Life Sciences with Laboratory I
- or PHY 191 General Physics with Laboratory I
- PHY 162 Physics for the Life Sciences with Laboratory II
- or PHY 192 General Physics with Laboratory II
- STC 135 Principles of Public Speaking
- or STC 136 Introduction to Interpersonal Communication

### Technical Courses from Associate Degree or as a Bridge to a Bachelor’s Completion

- CSE 153 Introduction to C/C++ Programming
- ENT 192 Circuit Analysis I
- ENT 193 Circuit Analysis II
- ENT 196 Electronics
- ENT 293 Digital Systems
- ENT 294 Local Area Networks
- ENT 295 Microprocessor Technology I

### Program Course Requirements (64 semester hours)

General Education Requirements

- If Associate Degree is from Miami:
  - Biological Science elective 3
  - Fine arts elective 3
  - Global Perspectives elective 3

- If Associate Degree is not from Miami:
  - Ohio Transfer Module

OR

Global Miami Plan Completion

Engineering Technology Requirements

- CHM 141 College Chemistry 3
- CHM 144 College Chemistry Laboratory 2
- ENT 271 Mechanics I: Statics 3
- ENT 298 Data Communications 3
- ENT 301 Dynamics 3
- ENT 303 Digital Signal Processing Technology 3
- ENT 311 Process Control Interface Design 3
- ENT 316 Project Management 3
- ENT 387 Embedded Systems Technology 3
- ENT 401 Computerized Instrumentation 3
- ENT 402 Industrial Automation Lab 3
- ENT 403 Wireless Communication and Networks 3
- ENT 418 Electro-Mechanical Control Systems 3
- ENT 497 Senior Design Project 2
- ENT 498 Senior Design Project 2
- MTH 231 Elements of Discrete Mathematics 3
- or MTH 222 Introduction to Linear Algebra 3
- MTH 251 Calculus II 4
- STA 301 Applied Statistics 3
- Intercultural Perspectives elective 3

General Education Courses from Associate Degree or as a Bridge to a Bachelor’s Completion.

Total Credit Hours 124

### Electro-Mechanical Engineering Technology (B.S. Completion Program)

The EMET program produces graduates who:

- possess the ability to apply theoretical knowledge to solve engineering technology problems associated with instrumentation and control systems.
- are knowledgeable of modern applications in process control systems.

The Electro-Mechanical Concentration is an Engineering Technology baccalaureate degree completion program for graduates of associate degree programs in electrical/electronics, mechanical, electro-mechanical or similar engineering technology programs. The objective of this program is to allow students who possess an associate degree in these areas to complete the bachelor degree in approximately the equivalent of two years of full-time work (64-70 semester hours). This program is accredited by the Engineering Technology Accreditation Commission of ABET (111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone, 410-347-7700, http://www.abet.org/).

Graduates are engineering technologists prepared to fill industrial positions in areas directly related to industrial automation, scientific programming, product design, process control, testing, manufacturing, sales, and service. Typical engineering technologist's duties may include working in teams involved with product analysis/design, instrumentation and control, CAD/CAM product design, laboratory testing services, product sales and service, product application, and the design of systems that require a hardware/software interface.

This program requires the completion of an Associate Degree from an accredited college or university in Electrical, Mechanical, Electro-Mechanical or similar engineering technology program.

### Program Requirements (64 semester hours)

General Education Requirements

- If Associate Degree is from Miami:
  - Biological Science elective 3
  - Fine arts elective 3
  - Global Perspectives elective 3

- If Associate Degree is not from Miami:
  - Ohio Transfer Module

OR

Global Miami Plan Completion

Engineering Technology Requirements

- CHM 141 College Chemistry 3
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General Education Courses from Associate Degree or as a Bridge to a Bachelor’s Completion.

Total Credit Hours 124

### Program Requirements (64 semester hours)

General Education Requirements

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  - Fine arts elective 3
  - Global Perspectives elective 3

- If Associate Degree is not from Miami:
  - Ohio Transfer Module

OR

Global Miami Plan Completion

Engineering Technology Requirements

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- Intercultural Perspectives elective 3

General Education Courses from Associate Degree or as a Bridge to a Bachelor’s Completion.

Total Credit Hours 124
Engineering Technology- Bachelor of Science in Applied Science

Additional Bridge Courses

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<td>STA 301</td>
<td>Applied Statistics</td>
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<td>MTH 251</td>
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<td>ENT 497</td>
<td>Senior Design Project</td>
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<td>ENT 418</td>
<td>Electro-Mechanical Control Systems</td>
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<td>ENT 407</td>
<td>Modern Manufacturing Systems</td>
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<td>ENT 406</td>
<td>Industrial Automation Lab</td>
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<td>ENT 405</td>
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<td>ENH 471</td>
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<td>ENH 472</td>
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<td>MTH 251</td>
<td>Calculus II</td>
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<tr>
<td>STA 301</td>
<td>Applied Statistics</td>
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</tbody>
</table>

Intercultural Perspectives elective 3

Total Credit Hours 124

1. This electro-mechanical concentration of courses provides depth in mechanical, electrical, and software integration necessary for automation.
2. Students with an Associate Degree in Electrical and Computer Engineering Technology, or similar program, must take ENT 151, ENT 271, and ENT 272. Students with an Associate Degree in Mechanical Engineering Technology, or similar program, must take ENT 193, ENT 196, and ENT 293.

Mechanical Engineering Technology Concentration

The Engineering Technology baccalaureate degree (Mechanical Engineering Technology concentration) is a completion program for graduates of associate degree programs in mechanical engineering technology. The objective of this program is to allow students who possess an associate degree in this area to complete the bachelor degree in approximately the equivalent of two years of full-time work (64-70 semester hours). This program is accredited by the Engineering Technology Accreditation Commission of ABET (111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone, 410-347-7700, http://www.abet.org/).

Mechanical Engineering Technology focuses on the applied aspects of mechanical and thermal-fluid analysis of the components in mechanisms, machines, products, and systems. The program requires a thorough understanding of applied mathematics and the engineering sciences. Students will develop the essential skills needed to apply experimental and empirical techniques to the study of systems and the solution of problems. This knowledge is used to research concepts, apply modeling methods, simulate and test operating conditions and their impact on the designed systems, and synthesize different elements to obtain an optimum design of a specific product.

Industry is in need of qualified mechanical engineering technologists who are familiar with measurement and test techniques in mechanical engineering. Computer Aided Engineering (CAE) including finite element analysis (FEA), computer-aided design (CAD), and analysis and the concepts of advanced mechanical design to the creation of sophisticated machines and systems.

The mechanical engineering technology concentration provides depth of study in mechanical and manufacturing engineering technology built on a solid foundation of mathematics, physics, and computer science. The program also provides breadth through required studies in economics, humanities, social science, global perspectives, and liberal arts.

Graduates will find employment opportunities in a diverse spectrum of professional fields. Many mechanical engineering technologists work on team projects within manufacturing-related areas such as testing, analysis, design, and the development of products. Graduates may also continue their education at graduate engineering technology/engineering levels.

This program requires the completion of an Associate Degree from an accredited college or university in Mechanical Engineering Technology, or similar engineering technology program.
• The following General Education and Technical courses are expected to have been taken within the Associate Degree’s minimum 60 semester hours.
• If an equivalent to any of these courses has not been completed already, they must be taken at Miami University to bridge the Associate Degree and Bachelor completion.

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<td><strong>Foundation Requirements (60 semester hours minimum)</strong></td>
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<td>ECO 201</td>
<td>Principles of Microeconomics</td>
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<td>EGS 215</td>
<td>Workplace Writing</td>
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<tr>
<td>or ENG 313</td>
<td>Technical Writing</td>
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<td>MTH 151</td>
<td>Calculus I</td>
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<td>PHY 161</td>
<td>Physics for the Life Sciences with Laboratory I</td>
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<td>or PHY 191</td>
<td>General Physics with Laboratory I</td>
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<td>STC 135</td>
<td>Principles of Public Speaking</td>
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<td>or STC 136</td>
<td>Introduction to Interpersonal Communication</td>
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<td><strong>Technical Courses from Associate Degree</strong></td>
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<td>CSE 163</td>
<td>Introduction to Computer Concepts and Programming</td>
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<td>ENT 135</td>
<td>Computer-Aided Drafting</td>
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<td>ENT 137</td>
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<td>ENT 151</td>
<td>Engineering Materials</td>
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<td>ENT 192</td>
<td>Circuit Analysis I</td>
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<td>ENT 235</td>
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<td>ENT 252</td>
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<td>ENT 271</td>
<td>Mechanics I: Statics</td>
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<td>ENT 272</td>
<td>Mechanics II: Strength of Materials</td>
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<td>ENT 278</td>
<td>Mechanics III: Analysis of Machine Components</td>
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<td>Biological Science elective</td>
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<tr>
<td>CHM 141</td>
<td>College Chemistry</td>
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<td>College Chemistry Laboratory</td>
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<td>ENT 301</td>
<td>Dynamics</td>
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<td>ENT 310</td>
<td>Fluid Mechanics</td>
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<td>ENT 312</td>
<td>Thermodynamics and Heat Power</td>
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<td>ENT 314</td>
<td>Mechanisms for Machine Design</td>
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<td>ENT 355</td>
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<td>ENT 404</td>
<td>Experimentation Techniques</td>
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<td>ENT 415</td>
<td>Heat Transfer with Applications</td>
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<td>Topics in Mechanical Vibrations</td>
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<td>STA 301</td>
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