



Mechanical Engineering Technology
Credential: Associate in Applied Science Degree
in Mechanical Engineering Technology
A40320

The Mechanical Engineering Technology curriculum prepares graduates for employment as technicians in the diversified mechanical and manufacturing engineering fields. Mechanical Engineering technicians assist in design, development, testing, process design and improvement, and troubleshooting and repair of engineered systems. Emphasis is placed on the integration of theory and hands-on application of engineering principles.

In addition to course work in engineering graphics, engineering fundamentals, materials and manufacturing processes, mathematics, and physics, students will study computer applications, critical thinking, planning and problem solving, and oral and written communication.

Graduates of the curriculum will find employment opportunities in the manufacturing or service sectors of engineering technology. Engineering technicians may obtain professional certification by application to organizations such as American Society for Quality Control (ASQC), Society of Manufacturing Engineers (SME), and National Institute for Certification in Engineering Technology (NICET).

Program Length: 6 semesters
 Career Pathway Options: Associate in Applied Science in Mechanical Engineering Technology
 Program Sites:
 Lee Campus - Day Program

Course Requirements for Mechanical Engineering Technology

A. General Education Courses (16 SHC)		C-L-SHC
ENG 111	Expository Writing	3-0-3
ENG 111A	Expository Writing Lab	0-2-1
ENG 114	Professional Research and Reporting	3-0-3
MAT 120	Geometry and Trigonometry	2-2-3
	Humanities/Fine Arts Elective	3-0-3
	Social/Behavioral Science Elective	3-0-3

B. Required Major Core Courses (23 SHC)

Required Subject Area		
CIS 111	Basic PC Literacy	1-2-2
DDF 211	Design Process I	1-6-4
DFT 151	CAD I	2-3-3
DFT 152	CAD II	2-3-3
MEC 161	Manufacturing Processes I	3-0-3
MEC 231	CAM I	1-4-3
MEC 250	Statics and Strength of Mat.	4-3-5

C. Other Major Hours Required for Graduation (34 SHC)

DFT 111	Technical Drafting I	1-3-2
DFT 153	CAD III	2-3-3

DFT 154	Introduction to Solid Modeling	2-3-3
DFT 214	Descriptive Geometry	1-2-2
MAC 121	Introduction to CNC	2-0-2
MAT 121	Algebra/Trigonometry I	2-2-3
MAT 122	Algebra/Trigonometry II	2-2-3
MEC 110	Introduction to CAD/CAM	1-2-2
MEC 130	Mechanisms	2-2-3
MEC 232	CAM II	1-4-3
PHY 131	Physics-Mechanics	3-2-4
PHY 133	Physics-Sound and Light	3-2-4

Total Semester Hours Credit required for graduation: 73

Semester Curriculum for Mechanical Engineering Technology Degree

1st Semester (Fall)		C-L-SHC
CIS 111	Basic PC Literacy	1-2-2
DFT 111	Technical Drafting I	1-3-2
DFT 151	CAD I	2-3-3
MAC 121	Introduction to CNC	2-0-2
MEC 110	Introduction to CAD/CAM	1-2-2
MEC 231	CAM I	<u>1-4-3</u>
		8-14-14
2nd Semester (Spring)		
DFT 152	CAD II	2-3-3
DFT 153	CAD III	2-3-3
DFT 214	Descriptive Geometry	1-2-2
MAT 120	Geometry and Trigonometry	2-2-3
MEC 161	Manufacturing Processes I	<u>3-0-3</u>
		10-10-14
3rd Semester (Summer)		
DDF 211	Design Process I	1-6-4
ENG 111	Expository Writing	3-0-3
ENG 111A	Expository Writing Lab	<u>0-2-1</u>
		4-8-8

A Mechanical Engineering Technology Diploma may be obtained.

4th Semester (Fall)		
DFT 154	Introduction to Solid Modeling	2-3-3
ENG 114	Professional Research and Reporting	3-0-3
MAT 121	Algebra/Trigonometry I	2-2-3
	Social/Behavioral Science Elective	<u>3-0-3</u>
		10-5-12

5th Semester (Spring)		
MAT 122	Algebra/Trigonometry II	2-2-3
MEC 130	Mechanisms	2-2-3
MEC 232	CAM II	1-4-3
PHY 131	Physics-Mechanics	3-2-4
	Humanities/Fine Arts elective	<u>3-0-3</u>
		11-10-16

6th Semester (Summer)		
MEC 250	Statics and Strength of Mat.	4-3-5
PHY 133	Physics- Sound and Light	<u>3-2-4</u>
		7-5-9

Total Semester Hours Credit Required for Graduation: 73

COURSE DESCRIPTIONS

CIS 111 Basic PC Literacy 1-2-2
 This course provides an overview of computer concepts. Emphasis is placed on the use of personal computers and software applications for personal and fundamental workplace use. Upon completion, students should be able to demonstrate basic personal computer skills.

DDF 211	Design Process I	1-6-4	ENG 111A	Expository Writing Lab	0-2-1
<p>This course emphasizes design processes for finished products. Topics include data collection from manuals and handbooks, efficient use of materials, design sketching, specifications, and vendor selection. Upon completion, students should be able to research and plan the design process for a finished product.</p>			<p><i>Prerequisites: RED 090 and ENG 090 or appropriate placement test scores</i> <i>Corequisites: ENG 111</i> This writing laboratory is designed to apply the skills introduced in ENG 111. Emphasis is placed on the editing and revision components of the writing process. Upon completion, students should be able to apply those skills in the production of final drafts in ENG 111. The computer is used as a writing and design tool for this course.</p>		
DFT 111	Technical Drafting I	1-3-2	ENG 114	Prof. Research and Reporting	3-0-3
<p>This course introduces basic drafting skills, equipment, and applications. Topics include sketching, measurements, lettering, dimensioning, geometric construction, orthographic projections and pictorial drawings, sections, and auxiliary views. Upon completion, students should be able to understand and apply basic drawing principles and practices.</p>			<p><i>Prerequisites: ENG 111</i> This course, the second in a series of two, is designed to teach professional communication skills. Emphasis is placed on research, listening, critical reading and thinking, analysis, interpretation, and design used in oral and written presentations. Upon completion, students should be able to work individually and collaboratively to produce well-designed business and professional written and oral presentations. The computer is used as a writing and design tool for this course. <i>This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in English composition.</i></p>		
DFT 151	CAD I	2-3-3	MAC 121	Introduction to CNC	2-0-2
<p>This course introduces CAD software as a drawing tool. Topics include drawing, editing, file management, and plotting. Upon completion, students should be able to produce and plot a CAD drawing.</p>			<p>This course introduces the concepts and capabilities of computer numerical control machine tools. Topics include setup, operation, and basic applications. Upon completion, students should be able to explain operator safety, machine protection, data input, program preparation, and program storage.</p>		
DFT 152	CAD II	2-3-3	MAT 120	Geometry and Trigonometry	2-2-3
<p>This course is a continuation of DFT 151. Topics include advanced two-dimensional, three-dimensional, and solid modeling and extended CAD applications. Upon completion, students should be able to generate and manage CAD drawings and models to produce engineering documents.</p>			<p><i>Prerequisites: MAT 070, MAT 080, MAT 121, MAT 161, MAT 171, or MAT 175 or appropriate placement test scores</i> This course introduces the concepts of plane trigonometry and geometry with emphasis on applications to problem solving. Topics include the basic definitions and properties of plane and solid geometry, area and volume, right triangle trigonometry, and oblique triangles. Upon completion, students should be able to solve applied problems both independently and collaboratively using technology.</p>		
DFT 153	CAD III	2-3-3	MAT 121	Algebra/Trigonometry I	2-2-3
<p>This course introduces advanced CAD applications. Emphasis is placed upon advanced applications of CAD skills. Upon completion, students should be able to use advanced CAD applications to generate and manage data.</p>			<p><i>Prerequisites: MAT 070 or MAT 080 or appropriate placement test scores</i> This course provides an integrated approach to technology and the skills required to manipulate, display, and interpret mathematical functions and formulas used in problem solving. Topics include simplification, evaluation, and solving of algebraic and radical functions; complex numbers; right triangle trigonometry; systems of equations; and the use of technology. Upon completion, students should be able to demonstrate an understanding of the use of mathematics and technology to solve problems and analyze and communicate results.</p>		
DFT 154	Introduction Solid Modeling	2-3-3	MAT 122	Algebra/Trigonometry II	2-2-3
<p>This course is an introduction to basic three-dimensional solid modeling and design software. Topics include basic design, creation, editing, rendering and analysis of solid models and creation of multi-view drawings. Upon completion, students should be able to use design techniques to create, edit, render and generate a multi-view drawing.</p>			<p><i>Prerequisites: MAT 121, MAT 161, MAT 171, or MAT 175</i> This course extends the concepts covered in MAT 121 to include additional topics in algebra, function analysis, and trigonometry. Topics include exponential and logarithmic functions, translation and scaling of functions, Sine Law, Cosine Law, vectors and statistics. Upon completion, students should be able to demonstrate an understanding of the use of technology to solve problems and to analyze and communicate results.</p>		
DFT 214	Descriptive Geometry	1			
<p><i>Prerequisites: DFT 111</i> This course includes a graphic analysis of space problems. Topics include points, lines, planes, connectors, and combinations of these. Upon completion, students should be able to solve real world spatial problems using descriptive geometry techniques.</p>					
ENG 111	Expository Writing	3-0-3			
<p><i>Prerequisites: RED 090 and ENG 090 or appropriate placement test scores</i> <i>Corequisites: ENG 111A</i> This course is the required first course in a series of two designed to develop the ability to produce clear expository prose. Emphasis is placed on the writing process including audience analysis, topic selection, thesis support and development, editing, and revision. Upon completion, students should be able to produce unified, coherent, well-developed essays using standard written English. <i>This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in English composition.</i></p>					

MEC 110 Introduction to CAD/CAM 1-2-2

This course introduces CAD/CAM. Emphasis is placed on transferring part geometry from CAD to CAM for the development of a CNC-ready program. Upon completion, students should be able to use CAD/CAM software to produce a CNC program.

MEC 130 Mechanisms 2-2-3

This course introduces the purpose and action of various mechanical devices. Topics include cams, cables, gear trains, differentials, screws, belts, pulleys, shafts, levers, lubricants, and other devices. Upon completion, students should be able to analyze, maintain, and troubleshoot the components of mechanical systems.

MEC 161 Manufacturing Processes I 3-0-3

This course provides the fundamental principles of value-added processing of materials into usable forms for the customer. Topics include material properties and traditional and non-traditional manufacturing processes. Upon completion, students should be able to specify appropriate manufacturing processing for common engineering materials.

MEC 231 Comp-Aided Manufact I 1-4-3

This course introduces computer-aided design / manufacturing (CAD / CAM) applications and concepts. Topics include software, programming, data transfer and verification, and equipment setup. Upon completion, students should be able to produce parts using CAD / CAM applications.

MEC 232 Comp-Aided Manufact. II 1-4-3

Prerequisites: MEC 231

This course provides an in-depth study of CAM applications and concepts. Emphasis is placed on the manufacturing of complex parts using computer-aided manufacturing software. Upon completion, students should be able to manufacture complex parts using CAM software.

MEC 250 Statics and Strength of Mat. 4-3-5

This course covers the concepts and principles of statics and stress analysis. Topics include systems of forces on structures in equilibrium and analysis of stresses and strains on these components. Upon completion, students should be able to analyze forces and the results of stresses and strains on structural components.

PHY 131 Physics-Mechanics 3-2-4

Prerequisites: MAT 121, MAT 161, MAT 171, or MAT 175

This algebra/trigonometry-based course introduces fundamental physical concepts as applied to engineering technology fields. Topics include systems of units, problem-solving methods, graphical analysis, vectors, motion, forces, Newton's laws of motion, work, energy, power, momentum, and properties of matter. Upon completion, students should be able to apply the principles studied to applications in engineering technology fields.

PHY 133 Physics-Sound and Light 3-2-4

Prerequisites: PHY 131

This algebra/trigonometry-based course is a study of fundamental physical concepts as applied to engineering technology fields. Topics include systems of units, problem-solving methods, graphical analysis, wave motion, sound, light, and modern physics. Upon completion, students should be able to apply the principles studied to applications in engineering technology fields.