

**Central Carolina Community College
Program Planning Guide**

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 coursework 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

Suggested Course Schedule:	HOURS			Grade	Semester	Notes
	Class	Lab	Credit			
1st Semester (Fall)						
CIS 110*	Introduction to Computers	2	2	3		
DFT 111	Technical Drafting I	1	3	2		
ENG 111	Expository Writing	3	0	3		
ENG 111A	Expository Writing Lab	0	2	1		
MAC 121	Introduction to CNC	2	0	2		
MEC 110	Introduction to CAD/CAM	1	2	2		
MAT 121	Algebra/Trigonometry I	2	2	3		
		11	11	16		
2nd Semester (Spring)						
DFT 151	CAD I	2	3	3		
PHY 131	Physics-Mechanics	3	2	4		
MAT 122	Algebra/Trigonometry II	2	2	3		
ENG 114	Professional Research & Reporting	3	0	3		
MEC 161	Manufacturing Processes I	3	0	3		
MEC 161A	Manufacturing Proc I Lab	0	3	1		
		13	10	17		
3rd Semester (Summer)						
PHY 133	Physics – Sound and Light	3	2	4		
4th Semester (Fall)						
DFT 152	CAD 11	2	3	3		
MEC 231	CAM I	1	4	3		
MEC 130	Mechanisms	2	2	3		
	Social/Behavioral Science Elective	3	0	3		
	Humanities/Fine Arts elective	3	0	3		
		11	9	15		

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5th Semester (Spring)

DDF 211	Design Proecess I	1	6	4			
DFT 154	Introduction to Solid Modeling	2	3	3			
<i>See Below</i>	Major Elective			3			
MEC 250	Statistics & Strength of Mat.	4	3	5			
		7	9	15			

Major Elective Course Listing (select 3 SHC)

DFT 153	CAD III	2	3	3			
DFT 254	Intermed Solid Model/Rend	2	3	3			
MEC 232	CAM II	1	4	3			

*May substitute CIS 111 (nontransferable)

Total Semester Hours Credit: 67

Course Descriptions Mechanical Engineering Technology:

CIS 110 Introduction to Computers 2-2-3

This course introduces computer concepts, including fundamental functions and operations of the computer. Topics include identification of hardware components, basic computer operations, security issues, and use of software applications. Upon completion, students should be able to demonstrate an understanding of the role and function of computers and use the computer to solve problems. This course has been approved for transfer under the CAA and ICAA as a premajor and/or elective course requirement.

DDF 211 Design Process I 1-6-4

Local Prerequisite: DFT 152

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.

DFT 111 Technical Drafting I 1-3-2

This course introduces basic drafting skills, equipment, and applications. Topics include sketching, measurements, lettering, dimensioning, geometric construction, orthographic projections and pictorials drawings, sections, and auxiliary views. Upon completion, students should be able to understand and apply basic drawing principles and practices.

DFT 151 CAD I 2-3-3

Local Prerequisite: DFT 111 or Instructor Approval

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.

DFT 152 CAD II 2-3-3

Local Prerequisite: DFT 151

This course introduces extended CAD applications. Emphasis is placed upon intermediate applications of CAD skills. Upon completion, students should be able to use extended CAD applications to generate and manage drawings.

DFT 153 CAD III 2-3-3

Local Prerequisite: DFT 152

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.

DFT 154 Introduction to Solid Modeling 2-3-3

Local Prerequisite: DFT 151

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.

DFT 254 Intermed Solid Model/Render 2-3-3

Prerequisites: DFT 154

This course presents a continuation of basic three-dimensional solid modeling and design software. Topics include advanced study of parametric design, creation, editing, rendering and analysis of solid model assemblies, and multiview drawing generation. Upon completion, students should be able to use parametric design techniques to create and analyze the engineering design properties of a model assembly.

ENG 111 Expository Writing 3-0-3

Prerequisites: Take one set: RED 090 and ENG 090, ENG 095, or appropriate placement test scores.

Corequisites: ENG 111A

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. This course has been approved for transfer under the CAA and ICAA as a general education course in English Composition.

ENG 111A Expository Writing Laboratory 0-2-1

Prerequisites: Take one set: RED 090 and ENG 090, ENG 095, or appropriate placement test scores.

Corequisites: ENG 111

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

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in ENG 111. The computer is used as a writing and design tool for this course.

ENG 114 Professional Research and Reporting 3-0-3

Prerequisite: ENG 111

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. This course has been approved for transfer under the CAA and ICAA as a general education course in English Composition.

MAC 121 Introduction to CNC 2-0-2

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.

MAT 121 Algebra/Trigonometry I 2-2-3

Prerequisite: Take one set: MAT 060 and MAT 070, MAT 060 and MAT 080, MAT 060 and MAT 090, MAT 095, MAT 120, MAT 121, MAT 161, MAT 171, MAT 175, or appropriate placement test scores.

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.

MAT 122 Algebra/Trigonometry II 2-2-3

Prerequisite: Take one: MAT 121, MAT 161, MAT 171, or MAT 175

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.

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 161A Manufacturing Proc I Lab 0-3-1

This course is a laboratory for MEC 161. Emphasis is placed on experiences that enhance the materials presented in MEC 161. Upon completion, students should be able to apply the laboratory experiences to the concepts presented in MEC 161.

MEC 231 Computer-Aided Manufacturing I 1-4-3

Prerequisite: MEC 110

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 Computer-Aided Manufacturing II 1-4-3

Prerequisite: 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

Local Prerequisite: MAT 122, PHY 131

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. studied as applied in industrial and service fields.

PHY 131 Physics-Mechanics 3-2-4

Prerequisite: Take one: 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

Prerequisite: 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.