



**Mechanical Engineering
Technology/Mechatronics Systems
Credential: Associate in Applied Science Degree
in Mechanical Engineering
Technology/Mechatronics Emphasis
A40320M0**

The Mechatronics Systems Technology curriculum prepares graduates for employment as technicians in the electro-mechanical field. Mechatronics technicians assist in design, development, testing, process design and improvement, and troubleshooting and repair of engineered systems. Emphasis is placed on the integration of electronics, microprocessors, and mechanical systems.

In addition to course work in engineering graphics, mechanical and electronic engineering fundamentals, materials and manufacturing processes, students will study computer applications, critical thinking, planning, 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 Institute of Electrical and Electronics Engineers (IEEE), 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/ Mechatronics Emphasis
Program Sites: Lee Campus - Day Program

Course Requirements for Mechanical Engineering Technology Degree/Mechatronics Emphasis

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 (21 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
ELC 111	Introduction to Electricity	2-2-3
MEC 161	Manufacturing Processes I	3-0-3
MEC 231	CAM I	1-4-3

C. Other Major Hours Required for Graduation (33 SHC)

DFT 153	CAD III	2-3-3
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DFT 154	Introduction to Solid Modeling	2-3-3
EGR 285	Design Project	0-4-2
ELC 127	Software for Technicians	1-2-2
ELN 110	Survey of Electronics	2-2-3
ELN 133	Digital Electronics	3-3-4
ELN 232	Introduction to Microprocessors	3-3-4
ISC 221	Statistical Process Control	3-0-3
MEC 110	Introduction to CAD/CAM	1-2-2
MEC 130	Mechanisms	2-2-3
PCI 170	DAQ and Control	3-3-4

Total Semester Hours Credit required for graduation: 70

Semester Curriculum for Mechanical Engineering Technology Degree/Mechatronics Emphasis

1st Semester (Fall)		C-L-SHC
CIS 111	Basic PC Literacy	1-2-2
DFT 151	CAD I	2-3-3
ELC 111	Introduction to Electricity	2-2-3
MEC 110	Introduction to CAD/CAM	1-2-2
MEC 231	CAM I	<u>1-4-3</u>
		7-13-13

2nd Semester (Spring)		
DFT 152	CAD II	2-3-3
DFT 153	CAD III	2-3-3
ELN 110	Survey of Electronics	2-2-3
ELN 133	Digital Electronics	3-3-4
MAT 120	Geometry and Trigonometry	2-2-3
MEC 161	Manufacturing Processes I	<u>3-0-3</u>
		14-13-19

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 with a Mechatronics Emphasis may be obtained.

4th Semester (Fall)		
DFT 154	Introduction to Solid Modeling	2-3-3
ELN 232	Introduction to Microprocessors	3-3-4
ENG 114	Professional Research and Reporting	3-0-3
	Humanity/Fine Arts Elective	3-0-3
	Social/Behavioral Science Elective	<u>3-0-3</u>
		14-6-16

5th Semester (Spring)		
EGR 285	Design Project	0-4-2
ELC 127	Software for Technicians	1-2-2
ISC 221	Statistical Process Control	3-0-3
MEC 130	Mechanisms	2-2-3
PCI 170	DAQ and Control	<u>3-3-4</u>
		9-11-14

Total Semester Hours Credit required for graduation: 70

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
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 151 CAD I** 2-3-3
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
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.
- DFT 153 CAD III** 2-3-3
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 Solid Modeling** 2-3-3
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.
- EGR 285 Design Project** 0-4-2
This course provides the opportunity to design and construct an instructor-approved project using previously acquired skills. Emphasis is placed on selection, proposal, design, construction, testing, and documentation of the approved project. Upon completion, students should be able to present and demonstrate operational projects.
- ELC 111 Introduction to Electricity** 2-2-3
This course introduces the fundamental concepts of electricity and test equipment to non-electrical/electronics majors. Topics include basic DC and AC principles (voltage, resistance, current, impedance); components (resistors, inductors, and capacitors); power; and operation of test equipment. Upon completion, students should be able to construct and analyze simple DC and AC circuits using electrical test equipment.
- ELC 127 Software for Technicians** 1-2-2
This course introduces computer software which can be used to solve electrical/electronics problems. Topics include electrical/electronics calculations, applications, and controls. Upon completion, students should be able to utilize a personal computer for electrical/electronics-related applications.
- ELN 110 Survey of Electronics** 2-2-3
This course introduces fundamental electrical and electronic concepts for non-electronic majors. Emphasis is placed on terminology and devices used in basic electronic and digital applications. Upon completion, students should be able to demonstrate a grasp of the fundamentals of modern electronic circuits.
- ELN 133 Digital Electronics** 3-3-4
This course covers combinational and sequential logic circuits. Topics include number systems, Boolean algebra, logic families, MSI and LSI circuits, AC/DC converters, and other related topics. Upon completion, students should be able to construct, analyze, verify, and troubleshoot digital circuits using appropriate techniques and test equipment.
- ELN 232 Introduction to Microprocessors** 3-3-4
Prerequisites: ELN 133
This course introduces microprocessor architecture and microcomputer systems including memory and input/output interfacing. Topics include assembly language programming, bus architecture, bus cycle types, I/O systems, memory systems, interrupts, and other related topics. Upon completion, students should be able to interpret, analyze, verify, and troubleshoot fundamental microprocessor circuits and programs using appropriate techniques and test equipment.
- ENG 111 Expository Writing** 3-0-3
Prerequisites: RED 090 and ENG 090 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 to satisfy the Comprehensive Articulation Agreement general education core requirement in English composition.*
- ENG 111A Expository Writing Lab** 0-2-1
Prerequisites: RED 090 and ENG 090 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 in ENG 111. The computer is used as a writing and design tool for this course.
- ENG 114 Prof. Research and Reporting** 3-0-3
Prerequisites: 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 to satisfy the Comprehensive Articulation Agreement general education core requirement in English composition.*
- ISC 221 Statistical Quality Control** 3-0-3
Prerequisites: Completion of curriculum mathematics requirement
This course covers the principles and techniques of statistical process control for the improvement of productivity. Emphasis is placed on basic statistics for quality control, organization and procedures for efficient quality control including inspections, process control, and tests of significance. Upon completion, students should be able to apply statistical principles and techniques to enhance production.

