

## Industrial Technologies

### Computer Integrated Machining

#### Credential: Associate in Applied Science Degree in Computer-Integrated Machining with an Emphasis in Tool, Die and Mold Making A50210

The Computer-Integrated Machining curriculum prepares students with the analytical, creative and innovative skills necessary to take a production idea from an initial concept through design, development and production, resulting in a finished product.

Coursework may include manual machining, computer applications, engineering design, computer-aided drafting (CAD), computer-aided machining (CAM), blueprint interpretation, advanced computerized numeric control (CNC) equipment, basic and advanced machining operations, precision measurement and high-speed multi-axis machining. Graduates should qualify for employment as machining technicians in high-tech manufacturing, rapid-prototyping and rapid-manufacturing industries, specialty machine shops, fabrication industries, and high-tech or emerging industries such as aerospace, aviation, medical, and renewable energy, and to sit for machining certification examinations.

This Program has an emphasis on Tool, Die and Mold Making.

Program Length: 6 semesters

Career Pathway Options: Associate in Applied Science in Computer-Integrated Machining with an Emphasis in Tool, Die and Mold Making

Program Sites: Lee Main Campus - Day Program

#### Course Requirements for Computer-Integrated Machining Technology with an emphasis in Tool, Die and Mold Making

<b>1. General Education Requirements (15 SHC)</b>	C-L-SHC
Humanities/Fine Arts Elective	3-0-3
Social/Behavioral Science Elective	3-0-3
English; Take one course:	
ENG 111 Writing and Inquiry	3-0-3
ENG 110 Freshman Composition	3-0-3
Communications. Take one course:	
ENG 112 Writing/Research in the Disciplines	3-0-3
ENG 114 Professional Research and Reporting	3-0-3
ENG 115 Oral Communication	3-0-3
ENG 116 Technical Report Writing	3-0-3
COM 110 Introduction to Communication	3-0-3
COM 120 Intro to Interpersonal Communication	3-0-3
COM 231 Public Speaking	3-0-3
Mathematics:	
MAT 110 Math Measurement & Literacy	2-2-3
<b>2. Major Requirements (16 SHC)</b>	
BPR 111 Print Reading	1-2-2

MAC 111	Machining Technology I	2-12-6
MAC 112	Machining Technology II	2-12-6
MAC 124	CNC Milling	1-3-2

### 3. Other Major Requirements (45 SHC)

BPR 121	Print Reading: Mechanical	1-2-2
MAC 113	Machining Technology III	2-12-6
MAC 122	CNC Turning	1-3-2
MAC 152	Adv Machining Calc	1-2-2
MAC 153	Compound Angles	1-2-2
MAC 171	Measure/Material & Safety	0-2-1
MAC 224	Advanced CNC Milling	1-3-2
MAC 226	CNC EDM Machining	1-3-2
MAC 241	Jigs and Fixtures I	2-6-4
MAC 243	Die Making I	2-6-4
MAC 244	Die Making II	1-9-4
MAC 245	Mold Construction I	2-6-4
MAC 246	Mold Construction II	1-9-4C
MEC 110	Introduction to CAD/CAM	1-2-2
MEC 142	Physical Metallurgy	1-2-2
Computers, take one course:		
CIS 111	Basic PC Literacy	1-2-2
CIS 110	Introduction to Computers	2-2-3

Total Semester Hours Credit required for graduation: 76

### Computer-Integrated Machining

#### Credential: Diploma in Computer-Integrated Machining D50210

The Computer-Integrated Machining curriculum prepares students with the analytical, creative and innovative skills necessary to take a production idea from an initial concept through design, development and production, resulting in a finished product.

Coursework may include manual machining, computer applications, engineering design, computer-aided drafting (CAD), computer-aided machining (CAM), blueprint interpretation, advanced computerized numeric control (CNC) equipment, basic and advanced machining operations, precision measurement and high-speed multi-axis machining.

Graduates should qualify for employment as machining technicians in high-tech manufacturing, rapid-prototyping and rapid-manufacturing industries, specialty machine shops, fabrication industries, and high-tech or emerging industries such as aerospace, aviation, medical, and renewable energy, and to sit for machining certification examinations.

Program Length: 3 semesters

Career Pathway Options: Associate in Applied Science in Computer-Integrated Machining with an Emphasis in Tool, Die and Mold Making (Higher entrance standards required); Diploma in Computer-Integrated Machining Technology  
Program Sites: Lee Main Campus – Day/Evening Program; Harnett Main Campus – Day/Evening Program

**Course Requirements for Computer-Integrated Machining Technology Diploma**

<b>1. General Education Requirements (9 SHC)</b>	<b>C-L-SHC</b>
Humanities/Fine Arts Elective	3-0-3
English; Take one course:	
ENG 102 Applied Communication II	3-0-3
ENG 110 Freshman Composition	3-0-3
Mathematics:	
MAT 110 Mathematical Measurement & Literacy	2-2-3
<b>2. Major Requirements (16 SHC)</b>	
BPR 111 Print Reading	1-2-2
MAC 111 Machining Technology I	2-12-6
MAC 112 Machining Technology II	2-12-6
MAC 124 CNC Milling	1-3-2
<b>3. Other Major Requirements (15 SHC)</b>	
BPR 121 Print Reading: Mechanical	1-2-2
CIS 111 Basic PC Literacy	1-2-2
MAC 113 Machining Technology III	2-12-6
MAC 152 Adv Machining Calc	1-2-2
MAC 171 Measure/Material & Safety	0-2-1
MEC 142 Physical Metallurgy	1-2-2

Total Semester Hours Credit required for graduation: 40

**Computer-Integrated Machining  
Credential: Certificate in Computer-Integrated Machining  
C50210**

The Computer-Integrated Machining curriculum prepares students with the analytical, creative and innovative skills necessary to take a production idea from an initial concept through design, development and production, resulting in a finished product.

Coursework may include manual machining, computer applications, engineering design, computer-aided drafting (CAD), computer-aided machining (CAM), blueprint interpretation, advanced computerized numeric control (CNC) equipment, basic and advanced machining operations, precision measurement and high-speed multi-axis machining.

Graduates should qualify for employment as machining technicians in high-tech manufacturing, rapid-prototyping and rapid-manufacturing industries, specialty machine shops, fabrication industries, and high-tech or emerging industries such as aerospace, aviation, medical, and renewable energy, and to sit for machining certification examinations.

Program Length: 2 semesters  
 Career Pathway Options: Associate in Applied Science in Computer-Integrated Machining with an Emphasis in Tool, Die and Mold Making (Higher entrance standards required); Diploma Computer Integrated-Machining (Higher entrance standards required); Certificate in Computer-Integrated Machining.  
 Program Sites: Lee Main Campus –Day/ Evening Program;

Harnett Main Campus –Day/ Evening Program

**Course Requirements for Computer-Integrated Machining Technology Certificate**

<b>1. General Education Requirements (3 SHC)</b>	<b>C-L-SHC</b>
MAT 110 Math Measurement & Literacy	2-2-3
<b>2. Major Requirements (10 SHC)</b>	
BPR 111 Print Reading	1-2-2
MAC 111 Machining Technology I	2-12-6
MAC 124 CNC Milling	1-3-2
<b>3. Other Major Requirements (5 SHC)</b>	
BPR 121 Print Reading: Mechanical	1-2-2
MAC 171 Measure/Material & Safety	0-2-1
MEC 142 Physical Metallurgy	1-2-2

Total Semester Hours Credit required for graduation: 18

**Industrial Systems Technology  
Credential: Associate in Applied Science  
Degree in Industrial Systems Technology  
A50240**

The Industrial Systems Technology degree equips students with comprehensive skills and training necessary to excel as a technician in an industrial environment. As a multi-craft curriculum, instruction emphasizes understanding of fundamental machine concepts, systems development, troubleshooting, maintenance practices & strategies, and practical applications. Hands-on labs provide real world scenarios and practical experience Topics include Electricity, PLC’s, Hydraulics, Pneumatics, Motors, Control Systems, Blueprints, Safety, Troubleshooting, HVAC, Welding, and Machining.

Upon completion of this degree, graduates should be able to safely troubleshoot, diagnose, repair, and maintain industrial equipment and facilities. Employment opportunities include: Industrial Technician, Manufacturing Technician, Maintenance Technician, Programmer, Facilities Technician, Controls Technician, Field Service Technician, Industrial Electrician, and many others.

Program Length: 5 semesters  
 Career Pathway Options: Associate in Applied Science in Industrial Systems Technology  
 Program Sites: Lee Main Campus - Day Program

**Course Requirements for Industrial Systems Technology**

<b>1. General Education Requirements (15/16 SHC)</b>	<b>C-L-SHC</b>
Humanities/Fine Arts Elective	3-0-3
Social/Behavioral Science Elective	3-0-3
English: Take one course:	
ENG 111 Writing and Inquiry	3-0-3
ENG 110 Freshman Composition	3-0-3
Communications, Take one course:	
ENG 112 Writing/Research in the Disciplines	3-0-3

ENG 114	Professional Research and Reporting	3-0-3
ENG 115	Oral Communication	3-0-3
ENG 116	Technical Report Writing	3-0-3
COM 110	Introduction to Communication	3-0-3
COM 120	Intro to Interpersonal Communication	3-0-3
COM 231	Public Speaking	3-0-3

Mathematics; Take one course:

PHY 121	Applied Physics I	3-2-4
MAT 110	Math Measurement & literacy	2-2-3

## 2. Major Requirements (18 SHC)

BPR 111	Print Reading	1-2-2
ELC 112	DC/AC Electricity	3-6-5
HYD 110	Hydraulics/Pneumatics I	2-3-3
ISC 110	Workplace Safety	1-0-1
MEC 111	Machine Processes I	1-4-3
MNT 110	Introduction to Maintenance Procedures	1-3-2
WLD 112	Basic Welding Processes	1-3-2

## 3. Concentration Requirements (14 SHC)

ELC 117	Motors and Controls	2-6-4
ELC 128	Introduction to PLC	2-3-3
ELC 228	PLC Applications	2-6-4
MNT 111	Maintenance Practices	2-2-3

## 4. Other Major Requirements (20 SHC)

AHR 120	HVACR Maintenance	1-3-2
CIS 111	Basic PC Literacy	1-2-2
ELN 231	Industrial Controls	2-3-3
ELN 260	Prog. Logic Controllers	3-3-4
HYD 121	Hydraulics/Pneumatics II	1-3-2
MNT 240	Industrial Equipment Troubleshooting	1-3-2
WLD 117	Industrial SMAW	1-4-3
Technical Electives (Take 1):		
ELC 229	Applications Project	1-3-2
WLD 121	GMAW (MIG) FCAW/Plate	2-6-4

## 5. Other Requirements (2 SHC)

WBL 111	Work-based Learning	0-10-1
ACA 122	College Transfer Success	1-0-1

Total Semester Hours Credit required for graduation: 69

## Industrial Systems Technology Credential: Diploma in Industrial Systems Technology D50240

The Industrial Systems Technology diploma equips students with the foundational skills and training necessary to excel as a technician or operator in an industrial environment. As a multi-craft curriculum, instruction emphasizes understanding of fundamental machine concepts, systems development, troubleshooting, maintenance practices & strategies, and practical applications. Hands-on labs provide real world scenarios and practical experience. Topics include Electricity, PLC's, Hydraulics, Pneumatics, Blueprints, Safety, Troubleshooting, HVAC, Welding, and Machining.

Upon completion of this diploma, graduates should have a firm understanding of how to safely troubleshoot, diagnose, repair, and maintain industrial equipment and facilities. Graduates are prepared to seek entry level technician positions or advanced operator positions.

Program Length: 3 semesters

Career Pathway Options: Associate in Applied Science in Industrial Systems Technology (Higher entrance standards required); Diploma in Industrial Systems Maintenance Technology

Program Sites: Lee Main Campus - Day Program

## Course Requirements for Industrial Systems Technology Diploma

### 1. General Education Requirements (9/10 SHC) C-L-SHC

Humanities/Fine Arts elective	3-0-3
English; Take one course:	
ENG 111 Writing and Inquiry	3-0-3
ENG 110 Freshman Composition	3-0-3
Mathematics: Take one course:	
MAT 110 Math Measurement & Literacy	2-2-3
PHY 121 Applied Physics I	3-2-4

### 2. Major Requirements (18 SHC)

BPR 111	Print Reading	1-2-2
ELC 112	DC/AC Electricity	3-6-5
HYD 110	Hydraulics/Pneumatics I	2-3-3
ISC 110	Workplace Safety	1-0-1
MEC 111	Machine Processes I	1-4-3
MNT 110	Introduction to Maintenance Procedures	1-3-2
WLD 112	Basic Welding Processes	1-3-2

### 3. Other Major Requirements (7 SHC)

AHR 120	HVACR Maintenance	1-3-2
CIS 111	Basic PC Literacy	1-2-2
WLD 117	Industrial SMAW	1-4-3

### 4. Concentration Requirements (6 SHC)

ELC 128	Introduction to PLC	2-3-3
MNT 111	Maintenance Practices	2-2-3

Total Semester Hours Credit required for graduation: 40

## Industrial Systems Technology Credential: Certificate in Electrical Controls C5024010

The Electrical Controls Certificate provides students with strong knowledge of industrial electricity and electrical systems. Students will learn AC/DC electricity, input devices, control relays, motor starters, control systems, and safety. Upon completion, students will have the flexibility of pursuing a Diploma or an Associate in Applied Science Degree in Industrial Systems Maintenance Technology.

Program Length: 3 semesters  
 Career Pathway Options: Associate in Applied Science in Industrial Systems Technology (Higher entrance standards required); Diploma in Industrial Systems Technology (Higher entrance standards required); Certificate in Electrical Controls

Program Sites: Lee Main Campus - Evening Program

**Course Requirements for Electrical Controls Certificate**

**1. Major Requirements (10 SHC)**

ELC 112	DC/AC Electricity	3-6-5
ELC 117	Motors and Controls	2-6-4
ISC 110	Workplace Safety	1-0-1

**2. Concentration Requirements (3 SHC)**

ELC 128	Introduction to PLC	2-3-3
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**3. Other Major Requirements (3 SHC)**

ELN 231	Industrial Controls	2-3-3
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Total Semester Hours Credit required for graduation: 16

**Industrial Systems Technology  
 Credential: Certificate in Industrial Hydraulics  
 C5024020**

The Industrial Hydraulics Certificate provides students with strong knowledge of hydraulics and pneumatics. Students will learn about components, symbols, system development, and virtual simulation. Upon completion, students will have the flexibility of pursuing a Diploma or an Associate in Applied Science Degree in Industrial Systems Technology.

Program Length: 3 semesters  
 Career Pathway Options: Associate in Applied Science in Industrial Systems Technology (Higher entrance standards required); Diploma in Industrial Systems Maintenance Technology (Higher entrance standards required); Certificate in Industrial Hydraulics  
 Program Sites: Lee Main Campus - Evening Program

**Course Requirements for Industrial Hydraulics Certificate**

**1. Major Requirements (5 SHC) C-L-SHC**

HYD 110	Hydraulics/Pneumatics I	2-3-3
MNT 110	Introduction to Maintenance Procedures	1-3-2

**2. Concentration Requirements (6 SHC)**

ELC 128	Introduction to PLC	2-3-3
MNT 111	Maintenance Practices	2-2-3

**3. Other Major Requirements (2 SHC)**

HYD 121	Hydraulics/Pneumatics II	1-3-2
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Total Semester Hours Credit: 13

**Industrial Systems Technology  
 Credential: Certificate in Programmable Logic  
 Controllers (PLC)  
 C5024030**

The PLC Certificate provides students with strong knowledge of PLC's and PLC applications. In addition, students will become proficient in the use of PLC software, hardware, maintenance and troubleshooting, and programming. Upon completion, students will have the flexibility of pursuing a Diploma or an Associate in Applied Science Degree in Industrial Systems Technology.

Program Length: 4 semesters  
 Career Pathway Options: Associate in Applied Science in Industrial Systems Technology (Higher entrance standards required); Diploma in Industrial Systems Technology (Higher entrance standards required); Certificate in Programmable Logic Controllers  
 Program Sites: Lee Main Campus - Evening Program

**Course Requirements for Programmable Logic Controller Certificate**

**1. Major Requirements (6 SHC) C-L-SHC**

ELC 112	DC/AC Electricity	3-6-5
ISC 110	Workplace Safety	1-0-1

**2. Concentration Requirements (7 SHC)**

ELC 128	Introduction to PLC	2-3-3
ELC 228	PLC Applications	2-6-4

**3. Other Major Requirements (4 SHC)**

ELN 260	Prog. Logic Controllers	3-3-4
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Total Semester Hours Credit required for graduation: 17

**Welding Technology  
 Credential: Associate in Applied Science Degree  
 in Welding Technology  
 A50420**

The Associate in Applied Science Degree in Welding Technology provides students with a sound understanding of the science, technology, and applications essential for successful employment in the welding and metalworking industry.

Instruction includes consumable and non-consumable electrode welding and cutting processes. Courses may include math, print reading, metallurgy, welding inspection, and destructive and non-destructive testing providing the student with industry-standard skills developed through classroom training and practical application.

Graduates of the Welding Technology curriculum may be employed as entry-level technicians in welding and metalworking industries. Career opportunities also exist in

construction, manufacturing, fabrication, sales, quality control, supervision, and welding-related self-employment.

Program Length: 5 semesters

Career Pathway Options: Associate in Applied Science in Welding Technology

Program Sites:

Lee Main Campus - Day Program

### Course Requirements for Paralegal Technology Degree

#### 1. General Education Requirements (15/16 SHC) C-L-SHC

Humanities/Fine Arts Elective	3-0-3
Social/Behavioral Science Elective	3-0-3
English; Take one course:	
ENG 111 Writing and Inquiry	3-0-3
ENG 110 Freshman Composition	3-0-3
Communications; Take one course:	
ENG 112 Writing/Research in the Disciplines	3-0-3
ENG 114 Professional Research and Reporting	3-0-3
ENG 115 Oral Communication	3-0-3
ENG 116 Technical Report Writing	3-0-3
COM 110 Introduction to Communication	3-0-3
COM 120 Intro to Interpersonal Communication	3-0-3
COM 231 Public Speaking	3-0-3
Mathematics; Take one course:	
MAT 110 Math Measurement & Literacy	2-2-3
PHY 121 Applied Physics	3-2-4

#### 2. Major Requirements (18 SHC)

WLD 110 Cutting Processes	1-3-2
WLD 115 SMAW (Stick) Plate	2-9-5
WLD 121 GMAW (MIG) FCAW/Plate	2-6-4
WLD 131 GTAW (TIG) Plate	2-6-4
WLD 141 Symbols & Specifications	2-2-3

#### 3. Other Major Requirements (35 SHC)

BPR 111 Print Reading	1-2-2
ISC 110 Workplace Safety	1-0-1
MEC 111 Machine Processes	1-4-3
WLD 116 SMAW (Stick) Plate/Pipe	1-9-4
WLD 132 GTAW (TIG) Plate/Pipe	1-6-3
WLD 151 Fabrication I	2-6-4
WLD 215 SMAW (Stick) Pipe	1-9-4
WLD 251 Fabrication II	1-6-3
WLD 261 Certification Practices	1-3-2
WLD 262 Inspections and Testing	2-2-3
WLD 265 Automated Welding/Cutting	2-6-4
Computers, take one course:	
CIS 111 Basic PC Literacy	1-2-2
CIS 110 Introduction to Computers	

#### 4. Other Requirements (1 SHC)

ACA 122 College Transfer Success	1-0-1
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Total Semester Hours Credit required for graduation: 69

## Welding Technology

### Credential: Diploma in Welding Technology D50420

The Diploma in Welding Technology provides students with a sound understanding of the science, technology, and applications essential for successful employment in the welding and metalworking industry.

Instruction includes consumable and non-consumable electrode welding and cutting processes. Courses may include math, print reading, metallurgy, welding inspection, and destructive and non-destructive testing providing the student with industry-standard skills developed through classroom training and practical application.

Graduates of the Welding Technology curriculum may be employed as entry-level technicians in welding and metalworking industries. Career opportunities also exist in construction, manufacturing, fabrication, sales, quality control, supervision, and welding-related self-employment.

Program Length: 4 semesters

Career Pathway Options: Diploma in Welding Technology

Program Sites:

Lee Campus - Day Program

### Course Requirements for the Welding Technology Diploma

#### 1. General Education Requirements (6 SHC) C-L-SHC

MAT 110 Mathematical Measurement and Literacy	2-2-3
English; Take one course:	
ENG 111 Writing and Inquiry	3-0-3
ENG 110 Freshman Composition	3-0-3

#### 2. Major Requirements (18 SHC)

WLD 110 Cutting Processes	1-3-2
WLD 115 SMAW (Stick) Plate	2-9-5
WLD 121 GMAW (MIG) FCAW/Plate	2-6-4
WLD 131 GTAW (TIG) Plate	2-6-4
WLD 141 Symbols & Specifications	2-2-3

#### 3. Other Major Requirements (18 SHC)

BPR 111 Print Reading	1-2-2
ISC 110 Workplace Safety	1-0-1
WLD 116 SMAW (Stick) Plate/Pipe	1-9-4
WLD 151 Fabrication I	2-6-4
WLD 262 Inspection and Testing	2-2-3
WLD 265 Automated Welding/Cutting	2-6-4

Total Semester Hours Credit required for graduation: 42

## **Welding Technology**

### **Credential: Certificate in Welding Technology C50420**

The Certificate in Welding Technology provides students with a sound understanding of the science, technology, and applications essential for successful employment in the welding and metalworking industry.

Instruction includes consumable and non-consumable electrode welding and cutting processes. Courses may include math, print reading, metallurgy, welding inspection, and destructive and non-destructive testing providing the student with industry-standard skills developed through classroom training and practical application.

Graduates of the Welding Technology curriculum may be employed as entry-level technicians in welding and metalworking industries. Career opportunities also exist in construction, manufacturing, fabrication, sales, quality control, supervision, and welding-related self-employment.

Program Length: 2 semesters, Day; 3 semesters, Evening  
 Career Pathway Options: Diploma in Welding Technology (Higher entrance standards required), Certificate in Welding Technology  
 Program Sites: Lee Main Campus - Day Program

#### **Course Requirements for the Welding Technology Certificate**

##### **1. Major Hours (18 SHC)**

WLD 110	Cutting Processes	1-3-2
WLD 115	SMAW (Stick) Plate	2-9-5
WLD 121	GMAW (MIG) FCAW/Plate	2-6-4
WLD 131	GTAW (TIG) Plate	2-6-4

##### **2. Other Major Requirements (3 SHC)**

BPR 111	Print Reading	1-2-2
ISC 110	Workplace Safety	1-0-1

Total Semester Hours Credit required for graduation: 18

## **Welding Technology**

### **Credential: Certificate in Robotic Welding Technology C50420R**

The Certificate in Robotic Welding Technology provides students with a sound understanding of the science, technology, and applications essential for successful employment in the welding and metalworking industry.

Instruction includes consumable welding and cutting processes. Courses may include safety, print reading, automated welding/cutting processes, metallurgy, welding inspection, and destructive and non-destructive testing providing the student with industry-standard skills developed through classroom training and practical application.

Graduates of the Robotics Certificate curriculum may be employed as entry-level technicians in welding and metalworking industries. Career opportunities also exist in construction, manufacturing, fabrication, sales, quality control, supervision, and welding-related self-employment.

Program Length: 3 semesters  
 Career Pathway Options: Diploma in Welding Technology (Higher entrance standards required), Certificate in Welding Technology  
 Program Sites: Lee Main Campus - Day Program

#### **Course Requirements for the Welding Technology Certificate**

WLD 110	Cutting Processes	1-3-2
WLD 121	GMAW (MIG) FCAW/Plate	2-6-4

##### **2. Other Major Requirements (7 SHC)**

BPR 111	Print Reading	1-2-2
ISC 110	Workplace Safety	1-0-1
WLD 265	Automated Welding/Cutting	2-6-4

Total Semester Hours Credit required for graduation: 13

## **Bioprocess Technology**

### **Credential: Associate in Applied Science in Bioprocess Technology A50440**

The Bioprocess Technology curriculum will prepare individuals to work as Process Operators in biological products manufacturing facilities. Students will combine foundational knowledge in basic science and communication skills, manufacturing technologies, and good manufacturing practices. Students will develop collaborative and disciplined work ethics while consistently practicing problem-solving skills. With successful completion of the program, individuals will qualify for employment in a variety of Bioprocessing industries like pharmaceutical manufacturing.

Program length: 5 full-time semesters or customized length part-time  
 Career Pathway options: Associate in Applied Science in Bioprocess Technology  
 Program Site/s: Lee Main Campus, Online, Hybrid/Blended

#### **Course requirements for Bioprocess Technology AAS Degree:**

##### **1. General Education Requirements (18 SHC)**

ENG 111	Writing & Inquiry	3-0-3
Take one:		
ENG 112	Writing Research in the Disp	3-0-3
ENG 114	Prof Research & Reporting	3-0-3
	Humanities Elective	3-0-3
	Social Behavioral Science Elective	3-0-3
	Communications Elective, take one:	

ENG 115	Oral Communications	3-0-3
ENG 116	Technical Report Writing	3-0-3
COM 110	Introduction to Communication	3-0-3
COM 120	Intro Interpersonal Com	3-0-3
COM 231	Public Speaking	3-0-3
Mathematics, take one:		
MAT 121	Algebra/Trigonometry I	2-2-3
MAT 171	Precalculus Algebra	3-2-4

**2. Major Requirements (25 SHC)**

BIO 110	Principles of Biology	3-3-4
BPM 110	Bioprocess Practices	3-4-5
BPM 111	Bioprocess Measurements	3-3-4
BPM 112	Upstream Bioprocessing	3-4-5
BPM 113	Downstream Bioprocessing	3-3-4
PTC 110	Industrial Environment	3-0-3

**3. Other Major Requirements (22 SHC)**

BIO 175	General Microbiology	2-2-3
CHM 131	Introduction to Chemistry	3-0-3
CHM 131A	Introduction to Chemistry Lab	0-3-1
CIS 110	Introduction to Computers	2-2-3
BUS 270	Professional Development	3-0-3

**Emphasis Requirements:**

ISC 121	Environmental Health & Safety	3-0-3
ISC 175	Quality Assurance Fundamentals	1-0-1
ISC 278	cGMP Quality Systems	2-0-2
ISC 280	Validation Fundamentals	1-2-2
PTC 228	Pharmaceutical Issues	1-0-1

**4. Other Requirements (2 SHC)**

WBL 111	Work Based Learning	0-10-1
ACA 122	College Transfer Success	0-2-1

**Total semester hours required for graduation: 67**

**Bioprocess Technology****Credential: Bioprocess Technology Diploma  
D50440**

Program Length: 3 full-time semesters or customized length part-time

Career Pathway Options: Associate in Applied Science

Degree in Bioprocess Technology; Diploma in Bioprocess Technology

Program Sites: Lee Main Campus; Online; Hybrid/Blended

**Course requirements for Bioprocess Technology****Diploma:****1. General Education Requirements:**

ENG 111	Writing & Inquiry	3-0-3
Mathematics, select one:		
MAT 121	Algebra/Trigonometry	2-2-3
MAT 171	Precalculus/Algebra	3-2-4

**2. Major Requirements:**

BPM 110	Bioprocess Practices	3-4-5
BPM 111	Bioprocess Measurements	3-3-4

BPM 112	Upstream Bioprocessing	3-4-5
BPM 113	Downstream Bioprocessing	3-3-4
PTC 110	Industrial Environment	3-0-3

**3. Other Major Requirements:**

BIO 110	Principles of Biology	3-3-4
CHM 131	Introduction to Chemistry	3-0-3
CHM 131A	Introduction to Chemistry Lab	0-3-1
CIS 110	Introduction to Computers	2-2-3

**4. Other Requirements:**

ACA 122	College Transfer Success	0-2-1
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**Total semester hours required for graduation: 39**

**Bioprocess Technology****Credential: Bioprocess Technology Certificate  
C50440**

Program Length: 2 part-time semesters or customized length

Career Pathway Options: Associate in Applied Science

Degree in Bioprocess Technology; Diploma in Bioprocess Technology

Program Site/s: Lee Main Campus; Online; Hybrid/Blended

**Course requirements for Bioprocess Technology  
Certificate**

BIO 110	Principles of Biology	3-3-4
BPM 110	Bioprocess Practices	3-4-5
BPM 111	Bioprocess Measurements	3-3-4
PTC 110	Industrial Environment	3-0-3

Total semester hours credit required for graduation: 16