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

1. General Education Requirements (15 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
MAT 121	Algebra /Trigonometry I	2-2-3

2. Major Requirements (16 SHC)

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
CIS 111	Basic PC Literacy	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	1-9-4
MEC 110	Introduction to CAD/CAM	1-2-2
MEC 142	Physical Metallurgy	1-2-2

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

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

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; Take one course:
MAT 110   Mathematical Measurement & Literacy   2-2-3
MAT 121   Algebra/Trigonometry I   2-2-3

2. Major Requirements (16 SHC)

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 (15 SHC)

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

1. General Education Requirements (3 SHC)   C-L-SHC
MAT 110   Math Measurement & Literacy   2-2-3

2. Major Requirements (10 SHC)

BPR 111   Print Reading   1-2-2
MAC 111   Machining Technology I   2-12-6
MAC 124   CNC Milling   1-3-2

3. Other Major Requirements (5 SHC)

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 curriculum is designed to prepare or upgrade individuals to safely service, maintain, repair and install equipment. Instruction includes theory and skill training needed for inspecting, testing, troubleshooting, and diagnosing industrial systems. Students will learn multi-craft technical skills in blueprint reading, mechanical systems maintenance, electricity, hydraulics/pneumatics, welding, machining or fabrication, as well as various diagnostic and repair procedures. Practical application in these industrial systems will be emphasized and additional advanced coursework may be offered.
Upon completion of this curriculum, graduates should be able to individually, or with a team, safely install, inspect, diagnose, repair and maintain industrial process and support equipment. Students will also be encouraged to develop their skills as life-long learners.

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

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:

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

Take one course:

ACA 111	College Student Success	1-0-1
ACA 115	Success and Study Skills	0-2-1
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 curriculum is designed to prepare or upgrade individuals to safely service, maintain, repair and install equipment. Instruction includes theory and skill training needed for inspecting, testing, troubleshooting, and diagnosing industrial systems. Students will learn multi-craft technical skills in blueprint reading, mechanical systems maintenance, electricity, hydraulics/pneumatics, welding, machining or fabrication, as well as various diagnostic and repair procedures. Practical application in these industrial

systems will be emphasized and additional advanced coursework may be offered.

Upon completion of this curriculum, graduates should be able to individually, or with a team, safely install, inspect, diagnose, repair, and maintain industrial process and support equipment. Students are encouraged to develop life-long learning skills.

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

This curriculum will provide students with knowledge of electricity and electrical controls. Students will learn AC/DC electricity, pilot devices, control relays, motor starters, and electromechanical devices. 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

3. Other Major Requirements (3 SHC)
ELN 231	Industrial Controls	2-3-3

Total Semester Hours Credit required for graduation: 16

Industrial Systems Technology
Credential: Certificate in Industrial Hydraulics
C5024020

This curriculum will provide students with knowledge of hydraulics and pneumatics. Students will learn hydraulic and pneumatic blueprint reading, how to repair valves and pumps, and how to measure and troubleshoot systems. 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

Total Semester Hours Credit: 13

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

This curriculum will provide students with 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

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 (Sick) 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
*CIS 111	Basic PC Literacy	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

4. Other Requirements (1 SHC)
Take one course:
ACA 111	College Student Success	1-0-1
ACA 115	Success and Study Skills	0-2-1
ACA 122	College Transfer Success	1-0-1

*Students may substitute CIS 110.

Total Semester Hours Credit required for graduation: 69/70

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

Public Service Technologies

Barbering
Credential: Associate in Applied Science in Barbering
A55110

The Barbering credential is designed to provide competency-based knowledge, scientific/artistic principles and hands-on fundamentals associated with the barbering industry. The curriculum also provides a simulated environment that enables students to develop manipulative skills. Coursework includes instruction in all phases of professional barbering, hair design, chemical processes, skin care, nail care, multi-cultural practices, business/computer principles, product knowledge and other selected topics. Graduates should qualify to sit for the State Board of Examiners. Upon successfully passing the State Board exam, graduates will be issued a license. Employment is available in barbershops and related businesses.

Program Specific Entrance Standards:
1. Must process student permit at least 10 days prior to being registered for classes.

Program Length: 6 semesters
Career Pathway Options: Associate in Applied Science in Barbering
Program Sites: Dunn Campus, Day
General Education courses may be taken on a main campus or through distance education

Course Requirements for Barbering Degree

1. General Education Requirements (15 SHC)   C-L-SHC
MAT 110	Mathematical Measurement and Literacy	2-2-3
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