

Engineering Technologies

*Effective 2014 Spring

**Computer Engineering Technology
 Credential: Associate in Applied Science
 Degree in Computer Engineering Technology
 A40160**

The Computer Engineering Technology curriculum provides the skills required to install, service, and maintain computers, peripherals, networks, and microprocessor and computer controlled equipment. It includes training in both hardware and software, emphasizing operating systems concepts to provide a unified view of computer systems.

Coursework includes mathematics, physics, electronics, digital circuits, and programming with emphasis on the operation, use, and interfacing of memory and devices to the CPU. Additional topics may include communications, networks, operating systems, programming languages, Internet configuration and design, and industrial applications.

Graduates will qualify for employment opportunities in electronics technology, computer service, computer networks, server maintenance, programming, and other areas requiring a knowledge of electronic and computer systems. Graduates will also qualify for certification in electronics, computers, or networks.

Program Length: 5 semesters
 Career Pathway Options: Associate of Applied Science
 Degree in Computer Engineering Technology
 Program Sites: Lee Campus - Day

**Course Requirements for Computer Engineering
 Technology Degree**

A. General Education (15 SHC)			
ENG 111	Expository Writing		3-0-3
ENG 114	Professional Research and Reporting		3-0-3
MAT 121	Algebra/Trigonometry I		2-2-3
	Humanities/Fine Arts Elective		3-0-3
	Social/Behavioral Science Elective		3-0-3
B. Technical Core Courses (12 SHC)			
ELC 131	Circuit Analysis I		3-3-4
ELN 131	Analog Electronics I		3-3-4
ELN 133	Digital Electronics		3-3-4
C. Program Major Courses (13 SHC)			
CET 111	Computer Upgrade/Repair I		2-3-3
ELN 232	Introduction to Microprocessors		3-3-4
NOS 110	Operating Systems Concepts		2-3-3
	*Programming Elective		3
D. Other Major Hours (35 SHC)			
CET 211	Computer Upgrade/Repair II		2-3-3
CET 225	Digital Signal Processing		2-2-3

CIS 110	Introduction to Computers		2-2-3
EGR 131	Intro to Electronics Tech		1-2-2
ELC 131A	Circuit Analysis I Lab		0-3-1
ELN 132	Analog Electronics II		3-3-4
ELN 275	Troubleshooting		1-2-2
MAT 122	Algebra/Trigonometry		2-2-3
NET 110	Networking Concepts		2-2-3
PCI 170	DAQ and Control		3-3-4
PHY 131	Physics: Mechanics		3-2-4
	** Technical Electives		2

Student Success—Select one:

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

*Programming Electives (choose 3 SHC)

CSC 134	C++ Programming		2-3-3
CSC 139	Visual BASIC Programming		2-3-3
CSC 151	JAVA Programming		2-3-3

**Technical Electives: (Select 2 SHC)

CSC 134	C++ Programming		2-3-3
CSC 139	Visual BASIC Programming		2-3-3
CSC 151	JAVA Programming		2-3-3
ELN 234	Communication Systems		3-3-4
ELN 247	Electronics Application Project		1-3-2
NET 125	Networking Basics		1-4-3
NET 126	Routing Basics		1-4-3
NOS 120	Linux/UNIX Single User		2-2-3
NOS 130	Windows Single User		2-2-3

Total Semester Hours Credit in Program: 75

**Semester Curriculum for Computer Engineering
 Technology Degree**

1st Semester (Fall)			C-L-SHC
CIS 110	Introduction to Computers		2-2-3
EGR 131	Intro to Electronics Tech		1-2-2
ELC 131	Circuit Analysis I		3-3-4
ELC 131A	Circuit Analysis I Lab		0-3-1
ENG 111	Expository Writing		3-0-3
ACA 111	College Student Success		1-0-1
MAT 121	Algebra/Trigonometry I		2-2-3
			12-12-17
2nd Semester (Spring)			
ELN 131	Analog Electronics I		3-3-4
ELN 133	Digital Electronics		3-3-4
MAT 122	Algebra/Trigonometry II		2-2-3
NOS 110	Operating Systems Concepts		2-3-3
PHY 131	Physics-Mechanics		3-2-4
			13-13-18
3rd Semester (Summer)			
ELN 132	Analog Electronics II		3-3-4
ENG 114	Prof. Research and Reporting		3-0-3
			6-3-7
4th Semester (Fall)			
CET 111	Computer Upgrade/Repair I		2-3-3
CET 225	Digital Signal Processing		2-2-3
ELN 232	Introduction to Microprocessors		3-3-4

	Social Science Elective	3-0-3
	Programming Elective	<u>2-3-3</u>
		12-11-16
5th Semester (Spring)		
CET 211	Computer Upgrade/Repair II	2-3-3
ELN 275	Troubleshooting	1-2-2
	Humanities/Fine Arts Elective	3-0-3
NET 110	Networking Concepts	2-2-3
PCI 170	DAQ and Control	3-3-4
	Technical Elective	<u>2</u>
		17

Total Semester Hours Credit: 75

*Effective 2014 Spring

**Electronics Engineering Technology
Credential: Associate in Applied Science
Degree in Electronics Engineering Technology
A40200**

This curriculum prepares individuals to become technicians who design, build, install, test, troubleshoot, repair, and modify developmental and production electronic components, equipment, and systems such as industrial/computer controls, manufacturing systems, telecommunication systems, and power electronic systems.

A broad-based core of courses, including basic electricity, solid-state fundamentals, digital concepts and microprocessors ensures the student will master the competencies necessary to perform entry-level tasks. Emphasis is placed on developing the student's ability to think, analyze, and troubleshoot.

Graduates will qualify for employment as engineering assistants or electronic technicians with job titles including electronic engineering associate, electronic engineering technician, field service technician, maintenance technician, electronic tester, electronic systems integrator, bench technician, and production control technician.

Program Length: 5 semesters

Career Pathway Options: Associate in Applied Science

Degree in Electronics Engineering Technology

Program Sites: Lee Campus - Day Program

**Course Requirements for Electronics Engineering
Technology Degree**

A. General Education Courses (15 SHC)		C-L-SHC
ENG 111	Expository Writing	3-0-3
ENG 114	Professional Research and Reporting	3-0-3
MAT 121	Algebra/Trigonometry I	2-2-3
	Humanities/Fine Arts Elective	3-0-3
	Social/Behavioral Science Elective	3-0-3
B. Technical Core (12 SHC)		
ELC 131	Circuit Analysis I	3-3-4
ELN 131	Analog Electronics I	3-3-4
ELN 133	Digital Electronics	3-3-4
C. Program Major (12 SHC)		
ELN 232	Introduction to Microprocessors	3-3-4
ELN 234	Communication Systems	3-3-4
ELN 132	Analog Electronics II	3-3-4
C. Other Major Hours (35 SHC)		
CET 225	Digital Signal Processing	2-2-3
CIS 110	Introduction to Computers	2-2-3
EGR 131	Introduction to Electronics Tech.	1-2-2
ELC 131A	Circuit Analysis I Lab	0-3-1
ELN 247	Electronic Applications Project	1-3-2

ELN 275	Troubleshooting	1-3-2
ISC 221	Statistical Quality Control	3-0-3
MAT 122	Algebra/Trigonometry II	2-2-3
PCI 170	DAQ and Control	3-3-4
PHY 131	Physics - Mechanics	3-2-4
PHY 133	Physics-Sound and Light	3-2-4
	Major Elective	3

Humanities/Fine Arts Elective	3-0-3
Major Elective	<u>3</u>
	17

Total Semester Hours Credit: 74

Student Success—Select one:

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

Major Elective Course Listing (Select 3 SHC)

CET 111	Computer Upgrade/Repair I	2-3-3
CSC 134	C++ Programming	2-3-3
CSC 151	JAVA Programming	2-3-3
DFT 151	CAD I	2-3-3
ELC 128	Introduction to PLCs	2-3-3
ELC 213	Instrumentation	3-2-4
ELN 236	Fiber Optics and Lasers	3-2-4
NET 110	Networking Concepts	2-2-3
NOS 110	Operating Systems Concepts	2-3-3

Total Semester Hours Credit Required for Graduation: 74

Semester Curriculum for Electronics Engineering
Technology Degree

1st Semester (Fall)		C-L-SHC
CIS 110	Introduction to Computers	2-2-3
EGR 131	Introduction to Electronics Tech.	1-2-2
ELC 131	Circuit Analysis I	3-3-4
ELC 131A	Circuit Analysis I Lab	0-3-1
ENG 111	Expository Writing	3-0-3
ACA 111	College Student Success	1-0-1
MAT 121	Algebra/Trigonometry I	<u>2-2-3</u>
		12-12-17
2nd Semester (Spring)		
ELN 131	Analog Electronics I	3-3-4
ELN 133	Digital Electronics	3-3-4
MAT 122	Algebra/Trigonometry II	2-2-3
PHY 131	Physics - Mechanics	<u>3-2-4</u>
		11-10-15
3rd Semester (Summer)		
ELN 132	Analog Electronics II	3-3-4
PHY 133	Physics-Sound and Light	<u>3-2-4</u>
		6-5-8
4th Semester (Fall)		
CET 225	Digital Signal Processing	2-2-3
ELN 232	Introduction to Microprocessors	3-3-4
ELN 234	Communication Systems	3-3-4
ENG 114	Professional Research and Reporting	3-0-3
	Social/Behavioral Science Elective	<u>3-0-3</u>
		14-8-17
5th Semester (Spring)		
ELN 247	Electronic Applications Project	1-3-2
ELN 275	Troubleshooting	1-3-2
ISC 221	Statistical Quality Control	3-0-3
PCI 170	DAQ and Control	3-3-4

*Effective 2014 Spring

Electronics Engineering Technology
Credential: Certificate in Electronics
Technology
C40200

This curriculum prepares individuals to work as skilled assemblers, inspectors, or testers in consumer or industrial electronics environments. Work tasks include mounting, soldering, and wiring of electronics components, assembling sub-units, and final assembly and inspection of complete systems. Coursework includes basic electricity, mathematics, solid-state electronics, and basic assembly skills. Graduates should qualify for employment as an electronics assembler, electronics tester, or electronics inspector.

Program Length: 3 semesters

Career Pathway Options: Associate in Applied Science Degree in Electronics Engineering Technology, Certificate in Electronics Technology

Program Sites:

Lee Campus - Day Program
 Harnett Campus – Day Program
 Online Program

Course Requirements for Electronics Technology Certificate

A. General Education Courses (3 SHC) C-L-SHC
 MAT 121 Algebra/Trigonometry I 2-2-3

B. Required Major Core Courses (13 SHC)
 ELC 131 Circuit Analysis I 3-3-4
 ELC 131A Circuit Analysis I Lab 0-3-1
 ELN 131 Analog Electronics I 3-3-4
 ELN 132 Analog Electronics II 3-3-4

C. Other Major Hours Required for Graduation (2 SHC)
 EGR 131 Introduction To Electronics Technology 1-2-2

Total Semester Hours Credit Required for Graduation: 18

Semester Curriculum for Electronics Technology Certificate

1st Semester (Fall) C-L-SHC
 EGR 131 Introduction to Electronics Technology 1-2-2
 ELC 131 Circuit Analysis I 3-3-4
 ELC 131A Circuit Analysis I Lab 0-3-1
 MAT 121 Algebra/Trigonometry I 2-2-3
 6-10-10

2nd Semester (Spring)
 ELN 131 Analog Electronics I 3-3-4
 3-3-4

3rd Semester (Summer)
 ELN 132 Analog Electronics II 3-3-4
 3-3-4

Total Semester Hours Credit Required for Graduation: 18

*Effective 2014 Spring

Laser and Photonics Technology
Credential: Associate in Applied Science
Degree in Laser and Photonics Technology
A40280

The Laser and Photonics Technology curriculum is designed to develop the practical knowledge and skills required to be a successful technician in business and industry.

Coursework includes mathematics, science, communication, electronics and optics courses. An in-depth sequence of laboratory learning experiences develops the hands-on skills needed for specifying, operating and maintaining laser and photonics-based systems.

Current and emerging job opportunities exist in the areas of fiber optic communications, materials processing, laser surgery, research and a variety of related areas. Program graduates often begin work as technicians in product testing, field service, product development or sales.

Program Length: 5 semesters

Career Pathway Options: Associate in Applied Science in Laser and Photonics Technology
 Program Sites: Harnett Campus - Day Program

Course Requirements for Laser and Photonics Technology Degree

A. General Education Courses (15 SHC) C-L-SHC
 ENG 111 Expository Writing 3-0-3
 ENG 114 Professional Research and Reporting 3-0-3
 MAT 121 Algebra/Trigonometry I 2-2-3
 Humanities/Fine Arts Elective 3-0-3
 Social/Behavioral Science Elective 3-0-3

B. Technical Core (12 SHC)
 ELC 131 Circuit Analysis I 3-3-4
 ELN 131 Analog Electronics I 3-3-4
 ELN 133 Digital Electronics 3-3-4

C. Program Major (13 SHC)
 LEO 111 Lasers and Applications 1-3-2
 LEO 211 Photonics Technology 5-6-7
 LEO 212 Photonics Applications 3-3-4

D. Other Major Hours Required for Graduation (34/35 SHC)
 CIS 111 Basic PC Literacy 1-2-2
 OR
 CIS 110 Introduction to Computers 2-2-3
 EGR 131 Introduction to Electronics Tech. 1-2-2
 ELC 131A Circuit Analysis I Lab 0-3-1
 ELN 132 Analog Electronics II 3-3-4
 LEO 221 PC Interface 3-3-4
 LEO 223 Fiber Optics 3-3-4
 ELC 127 Software for Technicians 1-2-2
 ELN 275 Troubleshooting 1-2-2
 ISC 221 Statistical Quality Control 3-0-3

MAT 122	Algebra/Trigonometry II	2-2-3
PHY 131	Physics - Mechanics	3-2-4
	Technical Elective	2

Student Success—Select one:

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

Technical Electives

COE 111	Co-Op Work Experience I	0-10-1
COE 121	Co-Op Work Experience II	0-10-1
COE 122	Co-Op Work Experience II	0-20-2
LEO 222	Photonics Applications Project	1-3-2

Total Semester Hours Credit Required for Graduation:

74/75

Semester Curriculum for Laser and Photonics Technology

Degree

1st Semester (Fall)		C-L-SHC
CIS 111	Basic PC Literacy	1-2-2
	OR	
CIS 110	Introduction to Computers	2-2-3
EGR 131	Introduction to Electronics Technology	1-2-2
ELC 131	Circuit Analysis I	3-3-4
ELC 131A	Circuit Analysis I Lab	0-3-1
ENG 111	Expository Writing	3-0-3
ACA 111	College Student Success	1-0-1
MAT 121	Algebra/Trigonometry I	2-2-3
		11/12-12-16/17

2nd Semester (Spring)

ELC 127	Software for Technicians	1-2-2
ELN 131	Analog Electronics I	3-3-4
ELN 133	Digital Electronics	3-3-4
LEO 111	Lasers and Applications	1-3-2
MAT 122	Algebra/Trigonometry II	2-2-3
		10-13-15

3rd Semester (Summer)

ELN 132	Analog Electronics II	3-3-4
PHY 131	Physics - Mechanics	3-2-4
		6-5-8

4th Semester (Fall)

ELN 275	Troubleshooting	1-2-2
ENG 114	Professional Research and Reporting	3-0-3
LEO 211	Photonics Technology	5-6-7
LEO 212	Photonics Applications	3-3-4
	Humanities/Fine Arts Elective	3-0-3
		15-11-19

5th Semester (Spring)

ISC 221	Statistical Quality Control	3-0-3
LEO 221	PC Interface	3-3-4
LEO 223	Fiber Optics	3-3-4
	Social/Behavioral Science Elective	3-0-3
	Technical Elective	2
		12/13- -16

Total Semester Hours Credit: 74/75

Sustainability Technologies

Credential: Associate in Applied Science in Sustainability Technologies A40370

The Sustainability Technologies curriculum is designed to prepare individuals for employment in environmental, construction, alternative energy, manufacturing, or related industries, where key emphasis is placed on energy production and waste reduction along with sustainable technologies.

Course work may include alternative energy, environmental engineering technology, sustainable manufacturing and green building technology. Additional topics may include sustainability, energy management, waste reduction, renewable energy, site assessment, and environmental responsibility.

Graduates should qualify for positions within the alternative energy, construction, environmental, and/or manufacturing industries. Employment opportunities exist in both the government and private industry sectors where graduates may function as manufacturing technicians, sustainability consultants, environmental technicians, or green building supervisors.

Program Length: 4 semesters

Career Pathway Options: Associate in Applied Science in Sustainability Technologies

Program sites: Pittsboro Campus

Course Requirements for Sustainability Technologies Degree

A. General Education Courses (15 SHC)	C-L-SHC
ENG 111 Expository Writing	3-0-3
*ENG 114 Professional Research and Reporting	3-0-3
Humanities/Fine Arts Elective	3-0-3
**MAT 121 Algebra/Trigonometry I	2-2-3
Social/Behavioral Science Elective	3-0-3

*Students may substitute ENG 113.

**Students may substitute MAT 161

B. Required Major Core Courses (12 SHC)

BIO 140 Environmental Biology	3-0-3
BIO 140A Environmental Biology Lab	0-3-1
-or-	
ENV 110 Environmental Science	3-0-3
SST 110 Intro to Sustainability	3-0-3
SST 120 Energy Use Analysis	2-2-3
SST 210 Issues in Sustainability	3-0-3