

ELC 131A Circuit Analysis I Lab 0-3-1

Total Semester Hours Credit Required for Graduation: 18

**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

I. General Education Academic Core (15 SHC) C-L-SHC

ENG 111	Writing and Inquiry	3-0-3
MAT 121	Algebra/Trigonometry I	2-2-3
	*Communication Elective	3-0-3
	Humanities/Fine Arts Elective	3-0-3
	Social/Behavioral Science Elective	3-0-3

II. Major Hours (59 SHC)

A. 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

B. 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

C. Other Major Hours Required for Graduation (34 SHC)

CIS 110	Introduction to Computers	2-2-3
EGR 131	Introduction to Electronics Tech.	1-2-2
ELC 127	Software for Technicians	1-3-2
ELC 131A	Circuit Analysis I Lab	0-3-1
ELN 132	Analog Electronics II	3-3-4
ELN 232	Intro to Microprocessors	3-3-4
ELN 275	Troubleshooting	1-3-2
ISC 221	Statistical Quality Control	3-0-3

LEO 213	Advanced Photonics Applications	3-3-4
MAT 122	Algebra/Trigonometry II	2-2-3
PHY 131	Physics - Mechanics	3-2-4
	**Technical Elective	2

III. Other Required Hours (1 SHC)

Choose 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 Required for Graduation: 75

***Communications Electives (Choose 3 SHC)**

ENG 112	Writing/Research in the Disciplines	3-0-3
ENG 114	Professional Research and Reporting	3-0-3
COM 231	Public Speaking	3-0-3

****Technical Electives (Choose 2 SHC)**

WBL 111	Work-Based Learning I	0-10-1
WBL 121	Work-Based Learning II	0-10-1
WBL 122	Work-Based Learning II	0-20-2
LEO 222	Photonics Applications Project	1-3-2

Sustainability Technologies

**Credential: Associate in Applied Science
 Degree 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: 5 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	Writing and Inquiry	3-0-3
*ENG 114	Professional Research and Reporting Humanities/Fine Arts Elective	3-0-3
**MAT 121	Algebra/Trigonometry I Social/Behavioral Science Elective	2-2-3 3-0-3

*Students may substitute ENG 113.

**Students may substitute MAT 171

B. Required Major Core Courses (13 SHC)		
BIO 140	Environmental Biology	3-0-3
BIO 140A	Environmental Biology Lab	0-3-1
SST 110	Intro to Sustainability	3-0-3
SST 120	Energy Use Analysis	2-2-3
SST 210	Issues in Sustainability	3-0-3

C. Other Major Hours Required (36/38 SHC)		
ALT 120	Renewable Energy Tech	2-2-3
ALT 250	Thermal Systems	2-2-3
ARC 111	Intro to Arch Technology	1-6-3
CIS 110	Introduction to computers	2-2-3
CST 111	Construction I	3-3-4
CST 112	Construction II	3-3-4
CST 150	Building Science	2-2-3
ELC 111	Introduction to Electricity	2-2-3
ELC 220	Photovoltaic Systems Tech	2-2-3
SST 130	Modeling Renewable Energy	2-2-3
SST 140	Green Building Design and Concepts	3-0-3
SST 250	Sustain Capstone Project	1-6-3
	-or-	
WBL 111	Work-Based Learning	0-10-1

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 (Select minimum 3 hours)		
ALT 110	Biofuels I	3-0-3
ALT 210	Biofuels II	3-2-4
ALT 211	Biofuels Analytics	2-4-4
ELC 221	Adv PV Sys Designs	2-3-3
MNT 230	Pumps and Piping Systems	1-3-2
BUS 280	REAL Small Business	4-0-4
AGR 139	Intro to Sustainable Ag	3-0-3

Total Semester Hours Credit Required for Graduation:
68/70

**Sustainability Technologies
Credential: Sustainability Certificate in
Sustainability Technologies
C40370S**

The Sustainability Technologies certificate is designed to prepare individuals for employment in environmental, construction, alternative energy, and other industries,

where key emphasis is placed on energy analysis and waste reduction along with sustainable technologies.

Course includes renewable energy, sustainability measures and green building technology. Additional topics may include green certification programs, energy management, green building design, renewable energy options, and environmental responsibility.

Graduates should qualify for positions within the construction, renewable energy or sustainability field. Employment opportunities exist in both the government and private industry sectors where graduates may function as sustainability consultants, energy analysts, or entry level green building and renewable energy technicians.

Program Length: 2 semesters

Career Pathway Options: Associate in Applied Science in Sustainability Technologies

Program sites: Pittsboro Campus

Course Requirements for Sustainability Certificate

Required Major Core Courses (15 SHC)

ALT 120	Renewable Energy Tech	2-2-3
SST 110	Intro to Sustainability	3-0-3
SST 120	Energy Use Analysis	2-2-3
SST 140	Green Building Design and Concepts	3-0-3
SST 210	Issues in Sustainability	3-0-3

Total Semester Hours Credit Required for Graduation: 15

**Sustainability Technologies
Credential: Green Building Certificate in
Sustainability Technologies
C40370GB**

The Green Building certificate is designed to prepare individuals for employment in construction where key emphasis is placed on sustainable building and design and green building certification programs.

Coursework will include an introduction to sustainability as well as trade specific classes in green building. Graduates should qualify for positions within the construction and green certification industries. Some courses include testing options for industry recognized certificates.

Employment opportunities exist in both government and private industry sectors where graduates may function as sustainability consultants, green building technicians, or weatherization technicians.

Program Length: 2 semesters

Career Pathway Options: Associate in Applied Science in Sustainability Technology

Program Sites: Pittsboro Campus

Course Requirements for Green Building Certificate

Required Courses (17 SHC)

ARC 111	Intro to Arch Technology	1-6-3
CST 111	Construction I	3-3-4
CST 112	Construction II	3-3-4
CST 150	Building Science	2-2-3
SST 140	Green Building & Designs Concepts	3-0-3

Total Semester Hours Credit Required for Graduation:
17

Sustainability Technologies
Credential: Biofuels Certificate in
Sustainability Technologies
C40370B

This program is designed to equip students with the skills needed to attain a technical position in the biofuels industry.

Students learn the fundamentals of biofuels as well as laboratory and mechanical skills need to conduct quality control testing and diagnose biofuels related problems.

Upon completion of the certificate students will be employable in a variety of biofuels markets, including fuel production, analysis, marketing, and distribution.

Program Length: 2 semesters
 Career Pathway Options: Associate in Applied Science in Sustainability Technologies
 Program sites: Pittsboro Campus

Course Requirements for Biofuels Certificate:

Required Major Core Courses (16 SHC)

ALT 120	Renewable Energy Tech	2-2-3
ALT 110	Biofuels I	3-0-3
ALT 210	Biofuels II	3-2-4
ALT 211	Biofuels Analytics	2-4-4
MNT 230	Pumps and Piping	1-3-2

Total Semester Hours Credit Required for Graduation: 16

Sustainability Technologies
Credential: Renewable Energy Certificate in
Sustainability Technologies
C40370RE

The Renewable Energy certificate is designed to prepare individuals for employment in renewable energy, or related industries, where key emphasis is placed on energy production along with sustainable technologies.

Coursework includes an introduction to sustainability as well as trade specific classes in renewable energy. Some courses include testing options for industry recognized certificates.

Graduates should qualify for positions within the renewable energy, construction, or environmental industries. Employment opportunities exist in both the government and private industry sectors where graduates may function as PV, solar thermal, or biofuels technicians.

Program Length: 2 semesters
 Career Pathway Options: Associate in Applied Science in Sustainability Technologies
 Program Sites: Pittsboro Campus

Course Requirements for Renewable Energy Certificate

ALT 110	Biofuels I	3-0-3
ALT 120	Renewable Energy Tech	2-2-3
ALT 250	Thermal Systems	2-2-3
ELC 111	Intro to Electricity	2-2-3
ELC 220	Photovoltaic Systems Technology	2-3-3
SST 130	Modeling Renewable Energy	2-2-3

Total Semester Hours Credit Required for Graduation: 18

Industrial Technologies

Computer Aided Drafting Technology
Credential: Associate in Applied Science
Degree in Computer-Aided Drafting
Technology
A50150

The Computer Aided Drafting Technology curriculum prepares graduates for employment as drafters or designers in a wide range of fields including mechanical and manufacturing engineering. Computer aided drafters and designers assist in the design and development of manufactured products.

This course-of-study prepares students to apply technical skills and advanced computer software and hardware to develop plans and related documentation, and manage the hardware and software of a CAD system. It includes instruction in architectural drafting, computer-aided-drafting (CAD), creating and managing two and three-dimensional models, and linking CAD documents to other software applications and operating systems.

In addition to coursework in computer aided drafting, students will study computer applications, machining, design, planning and problem solving, as well as oral and written communication.

Graduates of the curriculum should qualify for CAD jobs in architectural and engineering consulting firms and industrial design businesses.

Program Length: 5 semesters
 Career Pathway Options: Associate in Applied Science in Computer-Aided Drafting Technology