

Electronics (ELT)

6ELT 100S DC/AC Supplemental Instruction

2 Hours

Prerequisites: Concurrent enrollment in ELT 102 or ELT 111

2 hours weekly (2-0)

This course is designed to provide both group and individual supplemental instruction. The purpose is to provide additional opportunity for student success in the Electronics program.

This is a skill building course and is not used to calculate GPA at John A. Logan College. In addition, it will not transfer.

ELT 102 Basic Electricity and Wiring

4 Hours

Prerequisites: None

6 hours weekly (2-4)

This course is designed to give students a basic understanding of industrial electricity and power systems to include industrial control circuits.

ELT 103 Applied DC/AC Circuits

4 Hours

Prerequisites: ELT 102

6 hours weekly (2-4)

This course is designed to introduce the student to applied DC/AC circuits. DC topics will include the study of Superposition Theorem, filters, Voltage dividers. AC circuit analysis will include sinusoidal sources, RMS calculations, resonant circuits, capacitive and inductive time constants, series and parallel resonance, and transformers will be covered. Students will use the theory learned in the classroom to design and construct circuits in the laboratory,

computer simulation software will also be used. Test equipment will be used to take measurements and to perform basic trouble.

ELT 104 Introduction to VFDs

2 Hours

Prerequisites: ELT 102 with a grade of "C" or higher

3 hours weekly (1-2)

This course will introduce the student to variable frequency drive through theory and hands-on labs. The topics will include variable frequency drive safety, operation, setup, programming basic wiring and troubleshooting.

ELT 111 Digital Electronics I

3 Hours

Prerequisites: None

8 hours weekly (2-2)

This course will introduce students to basic digital technology. Number systems and basic and complex gate systems will be covered. Digital systems will be analyzed using techniques of Boolean algebra and Karnaugh mapping.

ELT 112 Digital Electronics II

3 Hours

Prerequisites: ELT 111 with a grade of "C" or higher

4 hours weekly (2-2)

This course continues the study of digital electronics technology through combinational and sequential logic systems, troubleshooting and advanced design techniques. The theory of operation of sequential logic circuitry that uses shift registers and counters will be explored. Hands-on labs will support the theories introduced in this course.

ELT 150 Applied Solid State Electronics

3 Hours

Prerequisites: ELT 102

4 hours weekly (2-2)

This course is designed to introduce the student to solid state devices, controls, and their applications. Basic theory of operation and troubleshooting practices will be introduced using meters and the oscilloscopes. Some of the devices covered will include diodes, transistor amplifiers, thyristors, and operational amplifiers.

ELT 151 Applied Solid State Circuits

3 Hours

Prerequisites: ELT 150

4 hours weekly (2-2)

This course is designed to introduce the student to applied solid-state circuits. Topics include the AC analysis transistor amplifier. Op amps integrators and differentiators, and active filters. Students will use the theory learned in the classroom to design and construct circuits in the laboratory.

ELT 170 Biomedical Instrumentation I

3 Hours

Prerequisites: ELT 102 and ELT 111 both with a grade of "C" or higher

4 hours weekly (2-2)

This course is one of three courses in a sequence that covers biomedical instrumentation and regulations. This course will cover safety, regulations, and monitoring systems.

ELT 200 Introduction to Microprocessors

3 Hours

Prerequisites: ELT 102, ELT 111

4 hours weekly (2-2)

The instruction, demonstration, and practice of beginning machine language programming of the Motorola 68000 microprocessor to be followed by an introduction to basic interfacing techniques.

ELT 210 A+ Preparation Essentials

3 Hours

Prerequisites: None

4 hours weekly (2-2)

CompTIA A+ Essentials validates knowledge of basic computer hardware and software systems, covering skills such as installation, building, upgrading, repairing, configuring, troubleshooting, and preventive maintenance, along with elements of security and soft skills. The Essentials Exam validates the basic skills needed by any entry-level service technician regardless of job environment.

ELT 214 A+ Preparation IT Technician

3 Hours

Prerequisites: None

4 hours weekly (2-2)

The CompTIA A+ Technician (220-602) exam is targeted for individuals who intend to work in a mobile or corporate technical environment with a high level of face-to-face client interaction. The CompTIA IT Technician (220-602) is for the candidate who has already passed the CompTIA A+ Essentials examination. Candidates who pass both the CompTIA A+ Essential and exam 220-602 will be CompTIA A+ certified with the IT Technician designation.

ELT 215 IOT and Embedded Systems

3 Hours

Prerequisites: ELT 102 and ELT 111 both with a grade of "C" or higher

4 hours weekly (2-2)

This course examines current micro-controller and SOC (system on a chip) hardware as embedded systems including current applications of hardware and software in the Internet of Things (IOT). Specific low-cost consumer micro-controllers and modern applications of the technology are examined, including various software and hardware interfacing.

ELT 218 Introduction to Network Technologies

3 Hours

Prerequisites: None

4 hours weekly (2-2)

This course is designed to allow students to obtain the skills necessary to work as an entry level network technician. The course is vendor neutral and allows the student to gain experience in network installation and administration. The successful student will be prepared to take the CompTIA Net + exam.

ELT 220 Linear Integrated Circuits

3 Hours

Prerequisites: ELT 151

4 hours weekly (2-2)

This course will introduce the student to applications of various devices covered in digital and solid states, such as switching and sensing devices. Various industrial power systems and equipment, such as load centers and motor and control circuits, will be covered.

ELT 224 Power Distribution and Motors

3 Hours

Prerequisites: ELT 102 or consent of instructor

4 hours weekly (2-2)

This course will be concerned with power distribution systems and motor loads. Both three phase and single phase will be discussed.

ELT 243 Renewable Energy Systems

3 Hours

Prerequisites: ELT 102 or HAC 102 with a minimum grade of "C"

4 hours weekly (2-2)

Students will develop knowledge in the solar energy technologies field. They will learn the various types of solar systems and how to set up a solar energy system. Also general maintenance and cost calculations will be covered.

ELT 250 Biomedical Instrumentation II

3 Hours

Prerequisites: ELT 102 with a minimum grade of "C"

ELT 111 with a minimum grade of "C"

4 hours weekly (2-2)

This course is one of three in a sequence that covers biomedical instrumentation and regulations. This course covers laboratory, life support, portable, and therapeutic equipment.

ELT 270 Introduction to Smart Grid

3 Hours

Prerequisites: ELT 102 or HAC 102 with a minimum grade of "C"

4 hours weekly (2-2)

This course will explore smart grid technology and how it applies to today's industries. The use of smart grid technology can help residential and commercial individuals to be more aware of their energy usage. Topics covered in this course will include: safety, traditional grid construction and operation, Smart grid operation, Smart grid communications, retrofits that may enhance energy management effectiveness for smart grid users & an overview of green energy systems building codes and compliance requirements. Also included will be hands-on labs that will allow the student to gain experience using today's industry hardware.

ELT 280 Biomedical Instrumentation III

3 Hours

Prerequisites: ELT 250 with a grade of "C" or higher

4 hours weekly (2-2)

This course is a continuation of Biomedical Instrumentation I and II and covers operating room equipment, diagnostic imaging equipment, medical specific test equipment and healthcare information technology for technicians.