

Course ID	Course Name	Course Outcome
CNET 50 (VOC)	PC Servicing	<p>Students completing CNET 50 will demonstrate effective troubleshooting strategies for isolating faults in all major personal computer (PC) subsystems and components.</p> <p>Students completing CNET50 will be able to add/remove input and output devices properly on computer systems running current operating systems.</p> <p>Students in CNET 50 will be able to define common terms and recognize symbols used in PC systems.</p>
CNET 52 (VOC)	PC Operating Systems	<p>CNET 52 students will demonstrate the ability to obtain technical information from each Windows operating system.</p> <p>Students completing CNET 52 will be able to install Windows operating systems.</p>
CNET 54 (VOC)	PC Troubleshooting	<p>Students completing CNET 54 will be able to demonstrate proper use of specific and general-purpose diagnostic aids available to the PC technician.</p> <p>Students completing CNET 54 will be able to identify component-level malfunctions in a typical personal computer.</p>
CNET 56	Computer Networks	<p>Students completing CNET 56 will be able to determine the most appropriate standards, protocols, and access methods for a given network.</p> <p>Students completing CNET 56 will be able to identify and distinguish among the different media used in network communications.</p> <p>Students completing CNET56 will be able to correctly determine an IPv4 address, broadcast address, and network address from a binary IPv4 address and binary subnet mask.</p>
CNET 58	Server Systems	<p>Students completing CNET58 will be able to install and configure local and network storage systems including SAN, NAS, RAID, etc., using current technologies.</p> <p>Students completing CNET58 will be able to install current network operating systems on both physical and virtual environments.</p>
CNET 60 (VOC)	A+ Certification Preparation	<p>CNET 60 students will be prepared to take the A+ Certification Exam.</p> <p>Students completing CNET 60 will be able to analyze types of preventative maintenance products and procedures, and when to use/perform them.</p>
CNET 62 (VOC)	Network+ Certification Preparation	<p>CNET 62 students will demonstrate understanding of basic network structures.</p> <p>Students completing CNET 62 will be prepared to pass the CompTIA Network+ examination.</p>
CNET 64	Server + Certification Preparation	<p>CNET64 students will demonstrate understanding of storage system fault tolerance.</p> <p>Students completing CNET 64 will be able to install servers into a network environment.</p> <p>Students completing CNET 64 will be prepared to pass the CompTIA Server+ examination.</p>
CNET 66	Security + Certification Preparation	<p>Students completing CNET 66 will be able to "harden" an operating system to protect computers from security threats.</p> <p>Students completing CNET 66 will be preped to pass the CompTIA Security+ examination.</p>

		Students completing CNET66 will be able to recommend risk mitigation and disaster recovery strategies to an organization.
ELEC 10 (VOC)	Intro to Mechatronics	<p>ELEC 10 students will be able to recognize standard symbols used in electronic schematic diagrams.</p> <p>ELEC 10 students will demonstrate proficiency in the assembly of an electromechanical system</p>
ELEC 11 (VOC)	Technical Applications in Microcomputers	<p>Define and discuss common vocabulary words associated with technology and computers.</p> <p>Demonstrate using the internet to research a given topic.</p> <p>Demonstrate various features of the Windows operating system specifically used in electronic technology.</p> <p>Design and implement various spreadsheet assignments including data in chart and graph form.</p> <p>Design and implement various word processing assignments including: memos, technical reports, and a resume.</p> <p>Identify features of computer presentation methods.</p> <p>Implement various database assignments including data manipulation, report generations.</p> <p>Students completing ELEC 11 will be able to produce an expense spreadsheet with a chart in Microsoft Excel.</p> <p>Students completing ELEC 11 will demonstrate the ability to produce a correctly formatted and error-free employment cover letter using Microsoft Word.</p> <p>Students completing ELEC 11 will demonstrate the ability to produce a correctly formatted and error-free resume in Microsoft Word</p>
ELEC 12 (VOC)	Computer Simulation and Troubleshooting	<p>Analyze circuits for faults.</p> <p>Analyze operational circuit parameters when component values are changed.</p> <p>Course completers will demonstrate the ability to isolate defective components on physical (as opposed to simulated) circuit boards.</p> <p>Demonstrate basic computer operating skills.</p> <p>Demonstrate how to troubleshoot circuits, and replace faulty components through simulation.</p> <p>Predict circuit operating parameters based on simulated characteristics.</p> <p>Using MultiSim students will be able to locate hidden faults in an analog circuit.</p> <p>Using MultiSim students will construct and simulate a discrete-component analog circuit.</p>
ELEC 50A (VOC)	Electronics Theory	<p>Analyze from problems various DC unknown quantities.</p> <p>Analyze from schematics various DC unknown quantities.</p> <p>As a consequence of significant program modification in which electronics math concepts will be covered in the ELEC 50A theory course, students in ELEC 50A will be able to numerically analyze a series-parallel circuit.</p> <p>Calculate unknown electrical quantities in DC circuits.</p> <p>Define common terms and recognize symbols used in DC electronic circuits.</p> <p>Demonstrate proper use of test equipment</p> <p>Explain circuit operation of various DC circuitry.</p>

Measure and record electrical quantities.

Predict unknown electronic quantities before solving electronic formulas.

Students completing ELEC 50A will be able to make accurate readings of voltage, current, and resistance using analog and digital multimeters.

Troubleshoot various defects in DC circuitry.

ELEC 50B (VOC) Electronics Theory

Analyze operation of AC circuits. (MO)

Calculate unknown electrical quantities in AC circuits. (MO)

Compare and contrast characteristics of series versus parallel AC circuits. (MO)

Define common terms and recognize symbols used in AC electronics. (MO)

Demonstrate the proper use of test equipment (oscilloscope, function generator, frequency counter) when measuring electrical quantities in a lab exercise. (MO)

Evaluate the characteristics of frequency selective circuits. (MO)

Measure and record AC electrical quantities. (MO)

Students completing ELEC 50B will be able to employ polar and/or rectangular notation to determine the magnitude and phase shift of an unknown circuit parameter (voltage, current, impedance, and/or power).

Students will be able to accurately measure amplitude and time parameters of a periodic waveform displayed on the oscilloscope screen.

ELEC 51 (VOC) Electronic Devices Theory

Analyze switching circuits and timers.

Analyze troubleshooting techniques of various semiconductor devices and circuits.

Analyze various op-amp design parameters.

Compare and contrast various oscillator types.

Explain operating parameters of various semiconductor devices and circuits.

Explain system application of various semiconductor devices and circuits.

Measure electrical quantities.

Students completing ELEC 51 will be able to determine expected gain and bandwidth of an operational amplifier.

Students completing ELEC 51 will be able to determine voltage gain and bandwidth characteristics of a common-emitter transistor amplifier.

ELEC 53 (VOC) Communications Circuits Theory

Calculate and analyze various modulation characteristics using a variety of modulation principles.

Compare and contrast various parameters of different modulation principles.

Define common communication terms used in telecommunication circuits.

Demonstrate effective use of test equipment during measurements on various communication circuits.

Evaluate and measure the reception effectiveness of several modulated sources.

Explain circuit operation of various communication circuits.

Measure and record parameters of several modulated sources.

Students completing ELEC 53 will be able to calculate the bandwidth and power characteristics of frequency-modulated signals using the table of normalized Bessel functions.

Students completing ELEC 53 will be able to interpret amplitude and frequency characteristics of signals displayed on the spectrum analyzer screen.

ELEC 54A (VOC) Industrial Circuits Theory

Analyze various parameters of industrial components and basic circuits.
Compare and contrast various DC and AC motor controls.
Compare and contrast various principles of power sources.
Define common industrial electronic terms.
Explain circuit applications of various industrial components and basic circuits.
Explain circuit operation of various industrial electronic components.
Explain operation and applications of various transducers.
Identify various principles of optoelectronic components.
Measure circuit parameters for various motor control circuits.
Students will be able to explain the operation of industrial electronic components in circuits
Students will be able to make comparative assessments of direct-current (DC) motor controls

ELEC 54B (VOC) Industrial Electronic Systems

Compare and contrast PLC programming methods.
Define common industrial electronic terms.
Demonstrate PLC programming methods.
Differentiate number systems and codes used with common PLCs.
Explain circuit operation of various industrial electronic circuits.
Explain system applications of various industrial electronic circuits.
Identify Programmable Logic Controller components.
Students completing ELEC 54B will be capable of assessing the quality of a programmable logic control (PLC) program.
Students completing ELEC 54B will be prepared to produce a ladder logic diagram for the control of an industrial process.
Students will be able to describe the key operational advantages of a PLC factory environment, including input, output, and communication protocols.
Synthesize the program (software) to the appropriate hardware electrical connection.

ELEC 55 (VOC) Microwave Communications

Calculate and analyze various microwave characteristics.
Compare and contrast Smith Chart values from those obtained by formula.
Define common microwave terms.
Explain circuit operation of various microwave components.
Explain system applications of various microwave components.
Measure common microwave parameters using microwave test equipment.
Plot graphically and analyze various microwave characteristics on the Smith Chart.
Students completing ELEC 55 will be able to use the Smith chart to match line and load impedances.
Students will be able to demonstrate the proper operation of laboratory equipment and correct interpretation of measured results of microwave power (both in milliwatts and dBm) and of standing wave ratio (SWR) as both a voltage ratio and in decibel units in a waveguide-based setup. Both measurements will be made with analog test equipment found in the microwave laboratory.

		Using laboratory equipment students will demonstrate the presence of standing waves on a microwave transmission line.
ELEC 56 (VOC)	Digital Electronics	<p>Analyze combinational logic circuits and waveforms.</p> <p>Analyze sequential logic circuits and wave forms.</p> <p>Demonstrate reduction techniques of combinational logic.</p> <p>Evaluate logic circuit parameters from truth tables.</p> <p>Measure logic circuit input and output signals using a variety of testing techniques.</p> <p>Recognize logic symbols and logic interpretation.</p> <p>Troubleshoot logic circuits and find faults.</p> <p>Using a state machine design, students will construct a synchronus counter that counts a random number sequence and then repeats.</p> <p>Using the design algorithm, students will design and build a combinational logic control circuit.</p>
ELEC 61 (VOC)	Electronic Assembly and Fabrication	<p>Define or explain various terms used in assembly and manufacturing processes.</p> <p>Demonstrate the proper manufacturing techniques of soldering and de-soldering.</p> <p>Design a printed circuit board using computer-aided drafting (CAD).</p> <p>Differentiate between types of assembly techniques and justify the merits of one versus the other.</p> <p>Recognize acceptable assembly connections from unacceptable ones.</p> <p>Students completing ELEC 61 will demonstrate the ability to capture a schematic and render a printed circuit board phototool from an instructor-supplied list of compoent requirements.</p> <p>Students will demonstrate the ability to assemble an electronic circuit board to approved industry standards (IPC7711/7721)</p> <p>Students will demonstrate the ability to solder a through-hole electronic circuit board to approved industry standards (IPC7711/7721)</p>
ELEC 62 (VOC)	Advanced Surface Mount Assembly and Rework	<p>In a laboratory setting, students will perform component removal, desoldering, and rework tasks to industry standards.</p> <p>Students will demonstrate the ability to solder a surface-mount electronic circuit board to approved industry standards (IPC7711/7721)</p>
ELEC 74 (VOC)	Microprocessor Systems	<p>Compare and contrast features of various types of PLDs.</p> <p>Compare and contrast various features of different interfacing devices.</p> <p>Compare and contrast various features of different process control circuits.</p> <p>Demonstrate a functional interface control circuit for a process control circuit.</p> <p>Demonstrate the use of interfacing devices in circuit operation.</p> <p>Program a PIC microcontroller using a development board.</p> <p>Program the PIC using the C programming language.</p> <p>Students completing ELEC 74 will be able to describe the relationship between hardware and software in a microcontroller.</p> <p>Students completing ELEC 74 will be able to install programs and development tools into microcontrollers or companion personal computers</p>

		Students in ELEC 74 will use different types of microcontroller platforms (such as Arduino or Fubarino) to implement projects of their own design.
ELEC 76 (VOC)	Radio Telephone Communications	<p>Apply electronic principles as they apply to the Element 3 license.</p> <p>Explain pertinent communications-related rules and regulations covered in the Element 1 license examination.</p> <p>Identify circumstances where possession of GROL is federally mandated for communications technicians in the marine and aviation radio services.</p> <p>Identify the requirements of the various FCC communication licenses.</p> <p>Solve electronic math problems.</p> <p>Students attempting to obtain a ship-radar endorsement will successfully complete NARTE examination</p> <p>Students completing ELEC 76 will successfully pass Elements 1 and 3 of the Federal Communications Commission General Radiotelephone Operator License examination.</p>
ELEC 81 (VOC)	Lab Studies Electronics	<p>Demonstrate completed project and report outcomes.</p> <p>Demonstrate proper use of lab equipment while working on project.</p> <p>Plan procedural steps in order to facilitate project completion.</p> <p>Research requisite information required to complete the project.</p> <p>Select a project idea that meets the need of the student.</p> <p>Students will demonstrate the ability to perform research necessary to obtain information sufficient to complete a semester project of the student's choosing.</p> <p>Students will demonstrate the ability to produce a project timeline showing procedural steps, critical tasks, and goals.</p>
ELEC 91	Work Experience in Electronics	<p>Demonstrate correct operation of equipment.</p> <p>Demonstrate good work habits.</p> <p>Demonstrate job competence of assigned duties while at the job site.</p> <p>Develop an occupational goal to which the work experience will contribute.</p> <p>Employers of Electronics & Computer Technology Work Experience students will rate the technical skills of their students as above average.</p> <p>Employers of Electronics & Computer Technology Work Experience students will rate the work habits of their students as above average.</p> <p>Expand responsibilities or learning opportunities beyond those experienced during previous employment.</p> <p>Follow procedures and protocols already in practice at the work site.</p>
TECH 60 (VOC)	Customer Relations for the Technician	<p>Compare and contrast ethical decisions made.</p> <p>Compare and contrast hard skills versus soft skills.</p> <p>Demonstrate proper customer and team interactions.</p> <p>Demonstrate proper responses and appropriate attire in an interview.</p> <p>Describe the benefits of using effective customer contact skills.</p> <p>Evaluate the effectiveness of appropriately used customer contact tools.</p>

Identify and use customer contact tools.

Know and use effective communication skills.

Know and use effective questioning techniques.

Students completing TECH 60 will be able to identify qualities employers seek in new hires.

Students completing TECH 60 will demonstrate the ability to answer questions in a positive manner in a mock job interview.

TECH 89

Preparation for Work Experience

Student will be able to complete a resume and cover letter to describe their work experiences.