

Electronics Engineering Technology Standards and Skills

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## Health & Safety Standards

### Standard 1: Safety and Health in an Electronics Engineering Technology Environment

Students will demonstrate effective health and safety practices in an electronics engineering technology work environment by correctly using personal protective equipment (PPE), following standard operating procedures for handling electronic components and tools, identifying and mitigating potential hazards, and adhering to safety regulations to ensure a safe and compliant workspace.

* Aligned Industry Recognized Credentials: OSHA 10 – General, ETA - Basic Systems Technician (BST)

#### Skills:

1. Identify, describe, and demonstrate the effective use of Safety Data Sheets (SDS) to meet documentation requirements.
2. Locate emergency equipment, first aid kit, and emergency action and response plan, including labels and signage that follow OSHA Hazard Communication Program (HAZCOM).
3. Demonstrate safe practices within the electronics laboratory following OSHA regulations, industry standards, and established shop safety procedures.
4. Apply standard Electrostatic Discharge (ESD) procedures by using grounded workstations, ESD-safe tools, and protective clothing, and regularly inspecting and maintaining ESD control equipment to prevent damage to sensitive electronic components.
5. Interpret chemical, product, and equipment labels to determine appropriate health and safety considerations.
6. Identify, describe, and apply Environmental Protection Agency (EPA) and other relevant environmental protection regulations related to the handling, disposal, and recycling of electronic waste, chemicals, and hazardous materials specific to electronics manufacturing and repair processes.
7. Demonstrate safe dress and use of relevant safety gear, and PPE, e.g., wrist rests, adjustable workspaces, equipment, gloves, proper footwear, earplugs, eye protection, and breathing apparatus.
8. Demonstrate appropriate safe body mechanics, including appropriate lifting techniques and workplace ergonomics.
9. Demonstrate the safe use, storage, and maintenance of equipment in the lab, shop, and classroom, e.g., the OSHA Lockout/Tagout Program (LOTO).
10. Describe safety practices and procedures for working with and around electricity, including the use of ground fault circuit interrupters (GFCIs).
11. Demonstrate appropriate workspace cleaning, sanitation, disinfection, and sterilization procedures in accordance with specific occupational regulations, such as OSHA guidelines, to ensure a safe and hygienic electronics work environment.
12. Describe procedures used to manage emergency situations, defensive measures, and accidents, including identification, reporting, response, evacuation plans, and follow-up procedures.
13. Apply fire protection procedures, precautions, and response plans.

## Technical & Integrated Academic Standards

### Standard 2: Role of Engineering Technology Professionals in Society

Student will analyze the role of electronics engineering technology professionals in society by evaluating their contributions to technological advancements, assessing the impact of their work on daily life and various industries, and demonstrating an understanding of ethical considerations, regulatory compliance, and the broader social implications of electronics innovations.

* Aligned Industry Recognized Credentials: ETA - Basic Systems Technician (BST)

#### Skills:

1. Examine and describe significant contributions made by electronics engineering professionals to technological advancements across various fields, including consumer electronics, computing and information technology, medical technology, automation, transportation, energy, entertainment, and scientific research.
2. Evaluate and apply Massachusetts Department of Environmental Protection (MassDEP) regulations related to the electronics industry, focusing on the Massachusetts e-Waste Disposal Ban and hazardous materials management.
3. Analyze Environmental Protection Agency (EPA) regulations affecting the electronics industry, including compliance with the Resource Conservation and Recovery Act (RCRA) for electronic waste (e-waste) management and the Toxic Substances Control Act (TSCA) for hazardous materials such as lead, mercury, and cadmium.

### Standard 3: Fundamentals of Circuit Assembly

Students will demonstrate the fundamentals of circuit assembly by accurately utilizing electronic components, creating detailed schematic diagrams, assembling circuits, and adhering to industry standards and safety regulations.

* Aligned Industry Recognized Credentials: ETA - Basic Systems Technician (BST)

#### Skills:

1. Identify and describe passive electronic components, e.g., resistors, capacitors, inductors, and explain their functions within a circuit.
2. Identify and explain active electronic components, e.g., transistors, diodes, integrated circuits, and describe their roles in electronic systems.
3. Differentiate between variable components, e.g., potentiometers and variable capacitors and describe their applications.
4. Identify electronic schematic symbols, including passive, active, and variable, to accurately interpret and apply them in circuit design and analysis.
5. Demonstrate creating a schematic diagram by sketching basic circuits by hand.
6. Apply schematic software to accurately create a basic circuit.
7. Generate a detailed parts list from a schematic diagram, including identifying components, locating vendors for electronic parts, and calculating the total cost of the parts.
8. Demonstrate constructing an electronic circuit prototype by arranging components on a solder-less breadboard, describing the connections, and ensuring compliance with current industry and OSHA standards.
9. Demonstrate assembling an electronic circuit on a printed circuit board by using solder to connect both leaded and surface mount components, and accurately differentiate polarity markings on components to ensure proper installation and functionality.

### Standard 4: Fundamentals and Applications of DC Circuits

Students will analyze and apply fundamental principles and laws of direct current (DC) circuits, including Ohm's Law, Watt’s Law, Kirchhoff’s Laws, and magnetism principles, to solve complex circuit problems and verify theoretical concepts through practical circuit construction and testing.

* Aligned Industry Recognized Credentials: ETA - Basic Systems Technician (BST)

#### Skills:

1. Explain Ohm's Law, including the relationships between voltage, current, and resistance.
2. Apply Ohm’s Law to solve for voltage, current, and resistance in various circuit problems, e.g., calculating the voltage drop across a resistor in a series circuit; determining the current through a resistor in a parallel circuit; and finding the resistance required to achieve a desired current with a given voltage source.
3. Explain Watt’s Law, including its relationship to power, voltage, and current.
4. Apply Watt’s Law to determine power consumption or dissipation in a circuit, e.g., calculating the power dissipated by a resistor given the voltage across it and the current through it; and determining the total power consumption of a circuit with multiple components given the total current and voltage.
5. Explain Kirchhoff’s Laws and their applications in circuit analysis.
6. Apply Kirchhoff’s Laws to analyze and verify circuit behavior, including applying Kirchhoff’s Current Law (KCL) to determine current at junctions and Kirchhoff’s Voltage Law (KVL) to evaluate voltage around closed loops.
7. Explain fundamental magnetism principles relevant to electronic circuits, including concepts such as magnetic fields, flux, and electromagnetic induction.
8. Apply principles of magnetism to analyze the operation of inductors and transformers in circuits, explaining how magnetic fields are used.
9. Determine the steps involved in applying Norton’s Theorem, including finding the Norton equivalent current source and parallel resistance.
10. Describe the steps involved in applying Thevenin’s Theorem, including finding the Thevenin equivalent voltage source and series resistance.
11. Demonstrate the steps involved in applying the Superposition Theorem, including considering each source independently while turning off other sources (replacing voltage sources with short circuits and current sources with open circuits).
12. Construct a circuit to apply and verify Thevenin’s Theorem.
13. Construct a circuit to apply and verify Norton’s Theorem.

### Standard 5: Fundamentals and Applications of AC Circuits

Students will analyze and apply fundamental principles of AC circuits, including waveform properties, circuit theory, resonance, and power characteristics, using theoretical concepts and practical skills to solve complex problems, measure and troubleshoot behaviors, and validate findings through simulation and graphical analysis.

* Aligned Industry Recognized Credentials: ETA - Basic Systems Technician (BST)

#### Skills:

1. Explain the basic principles of AC circuits, including differences between AC and DC, and the nature of AC waveforms.
2. Explain AC signal generation and sources, identifying different AC sources and their applications.
3. Analyze AC circuit theory, including reactance, impedance, and phase relationships.
4. Calculate and analyze waveform properties, including RMS, peak, peak-to-peak, average values, frequency, time, and duty cycle of a sine wave.
5. Demonstrate calculating phase shift and power parameters, including apparent power, true power, reactive power, and power factor, to understand their impact on AC circuit behavior.
6. Demonstrate calculating reactance, impedance, and filter circuit parameters.
7. Demonstrate calculating transformer characteristics and resonance frequencies in LC and RLC circuits to understand their roles in AC circuits.
8. Demonstrate measuring waveform properties, including peak, peak-to-peak values, frequency, time, and duty cycle of a sine wave.
9. Demonstrate measuring phase shift and power factor in AC circuits to analyze their effects on circuit behavior.
10. Graphically plot and analyze reactance and impedance versus frequency to understand how they vary with frequency.
11. Employ oscilloscopes to visually analyze waveform characteristics and diagnose issues.
12. Demonstrate troubleshooting common issues in AC circuits, such as resonance problems or impedance mismatches.
13. Utilize simulation software (e.g., LTspice, Multisim, Tinkercad Circuits) to model AC circuits.
14. Simulate AC-circuit behavior to analyze parameters such as impedance, phase shift, and power consumption.
15. Interpret simulation results to validate theoretical calculations and circuit designs.
16. Design and test virtual circuit designs using simulation tools to gain insights into circuit performance.
17. Examine the presence of harmonics in AC circuits and understand their impact on circuit performance and signal distortion.
18. Explain the decomposition of complex waveforms into sine and cosine components, and how this analysis helps in interpreting waveform behavior and circuit performance.

### Standard 6: Fundamentals and Applications of Analog Electronics

Students will be able to apply the fundamental concepts of analog electronics by analyzing and testing semiconductor devices, designing and evaluating transistor and operational amplifier circuits, and demonstrating effective thermal management techniques.

* Aligned Industry Recognized Credentials: ETA - Basic Systems Technician (BST)

#### Skills:

1. Define analog electronics, explaining its significance in electronic systems and its applications in various domains like audio amplification, radio frequency communication, and signal conditioning.
2. Analyze semiconductors, detailing the fundamental properties that make them essential in electronic devices, including their electrical conductivity and role in controlling electronic signals.
3. Describe the differences between conductors, insulators, and semiconductors, focusing on their electrical properties and how they affect the flow of electric current.
4. Compare the properties of intrinsic and extrinsic semiconductors and explain how doping alters their properties to enhance conductivity.
5. Explain the importance of manufacturers' specifications, e.g., voltage, current ratings, power dissipation for selecting and using semiconductor components effectively.
6. Describe the types and functions of discrete semiconductors such as diodes, transistors, and thyristors, detailing their roles in electronic circuits.
7. Explain the concept of biasing in semiconductor devices and its importance in ensuring proper operation.
8. Examine and explain different biasing configurations for transistors, such as common emitter and common collector.
9. Demonstrate thermal management techniques for semiconductors, including the use of heat sinks and thermal compounds, to prevent overheating and ensure reliable operation.
10. Describe various types of transistors, such as Bipolar Junction Transistors (BJTs) and Field Effect Transistors (FETs), including their operating principles and applications.
11. Explain transistor configurations, e.g., common emitter, common collector, including their operating principles and typical applications.
12. Explain the operation of rectifier and regulator diodes and their roles in power conversion and regulation.
13. Describe thyristors, including their types and uses in power control applications.
14. Utilize a digital multimeter to measure the forward voltage drop across a diode.
15. Demonstrate testing BJTs and FETs to verify their operation and identify faults.
16. Explain the four elements of MOSFETs and their roles in transistor operation.
17. Demonstrate conducting tests on thyristors to verify their switching characteristics and operational integrity.
18. Measure and explain current and voltage characteristics for diodes, transistors, and thyristors.
19. Analyze transistor amplifier circuits to understand their operation, gain characteristics, and frequency response.
20. Analyze oscillator circuits to understand their principles of operation, including frequency determination and waveform generation.
21. Evaluate operational amplifier circuits by examining their design, functionality, and performance.
22. Describe the characteristics of operational amplifier integrated circuits (ICs), including input offset voltage, input bias current, slew rate, and open-loop gain.
23. Design operational amplifier circuits for various applications, such as amplifiers, filters, and oscillators.

### Standard 7: Fundamentals and Applications of Digital Electronics

Students will demonstrate skills in digital electronics by performing calculations, applying digital principles, and constructing and testing digital circuits, including logic gates, flip-flops, counters, encoders, and decoders, with accurate analysis and practical application.

* Aligned Industry Recognized Credentials: ETA - Basic Systems Technician (BST)

#### Skills:

1. Examine the basic principles of digital electronics, including binary systems and digital vs. analog signals.
2. Apply the two’s complement number system for performing arithmetic operations such as addition, subtraction, and multiplication in digital circuits.
3. Demonstrate converting numbers between binary, decimal, and hexadecimal systems, including complex numbers, and verify conversions.
4. Apply digital codes like BCD, ASCII, and Gray code in encoding and decoding data.
5. Translate Boolean algebra expressions into detailed logic diagrams using standard logic gate symbols and verify the logical flow.
6. Generate comprehensive truth tables from Boolean expressions or logic circuits.
7. Demonstrate simplifying digital circuits using Boolean algebra reduction theorems such as De Morgan’s laws and Karnaugh maps.
8. Interpret timing waveforms for latches and flip-flops, focusing on setup and hold times, propagation delays, and clocking behavior.
9. Examine waveforms from counter circuits, analyzing frequency, timing characteristics, and performance.
10. Explain the characteristics of high, low, and tri-state signals and their implications for circuit design and signal integrity.
11. Identify and describe TTL gates from the 7400 series, including their input/output characteristics like voltage levels and current drive.
12. Identify pin numbers and manufacturer markings on digital ICs to ensure correct integration into circuits.
13. Compare TTL (Transistor-Transistor Logic) and CMOS (Complementary Metal-Oxide-Semiconductor) logic families in terms of speed, power consumption, noise margins, and interfacing requirements.
14. Apply parity checking methods for error detection, including calculating parity bits for even and odd parity schemes.
15. Explain the universal properties of NAND and NOR gates, including their ability to function as any other basic logic gate (AND, OR, NOT).
16. Illustrate and interpret alternate schematic forms of basic logic gates, including different representations of AND, OR, and NOT gates in various circuit designs.
17. Identify and describe various combinational logic circuits, e.g., multiplexers, decoders, and sequential logic circuits, e.g., counters, shift registers.
18. Apply reduction theorems for circuit simplification, including Karnaugh maps and Boolean algebra techniques.
19. Identify and describe the basic architecture and components of a microprocessor or microcontroller.
20. Explain the operation and design of digital oscillator circuits, focusing on frequency generation and stability.
21. Explain the operation of circuits that perform analog-to-digital (A/D) and digital-to-analog (D/A) conversion.
22. Demonstrate how to design with, and use, integrated circuits, including considerations for selecting ICs for specific applications.
23. Analyze and interpret timing diagrams to understand their impact on circuit operation and performance.
24. Identify and address issues related to noise and signal degradation and apply methods to improve signal quality.
25. Define and describe programmable logic devices (PLDs), including types and their use in implementing complex logic functions.
26. Explain line driver characteristics and their role in driving signals over long distances and interfacing components.
27. Execute wiring and testing combinational logic circuits like adders and multiplexers and explain their operation and functionality.
28. Apply wire and test flip-flops, e.g., D, JK, T, and validate their truth tables and their behavior in sequential circuits.
29. Employ wiring and testing latches, e.g., SR, D, and verify their operation and truth tables.
30. Construct and analyze waveforms for counter circuits, analyzing their timing and counting sequence.
31. Demonstrate building and simulating encoder and decoder circuits, explaining their role in converting data between different formats.
32. Demonstrate building and simulating shift registers, with an explanation of their operation in serial and parallel data handling.
33. Demonstrate constructing and simulating comparators, explaining their function in comparing binary numbers.
34. Design, build, and simulate adder circuits, explaining their role in binary addition and handling carry bits.
35. Demonstrate constructing and simulating multiplexer ICs, explaining their operation as data selectors in digital systems.
36. Demonstrate use of diagnostic tools and techniques, such as oscilloscopes, multimeters, and logic probes, to test and analyze digital circuits, identifying and resolving issues related to signal integrity, timing, and component functionality.
37. Conduct visual inspections, assess component placement, verify connections, and consult circuit diagrams and datasheets to troubleshoot and correct faults in digital electronic systems.

### Standard 8: Electronics Engineering and Computer Integration

Students will demonstrate proficiency in applied engineering by integrating engineering design processes, advanced problem-solving techniques, and modern methodologies to develop and execute electronics projects.

* Aligned Industry Recognized Credentials: ETA - Basic Systems Technician (BST)

#### Skills:

1. Apply iterative steps of the engineering design process to electronics projects, focusing on advanced problem-solving techniques.
2. Collaborate using structured brainstorming and modern methodologies to develop innovative solutions.
3. Utilize engineering notations and prefixes effectively in documentation.
4. Manage and maintain detailed technical design reports and comprehensive engineering logs/journals.
5. Select and apply various media formats for effective communication of designs and processes.
6. Identify and operate electric and stepper motors and design and test advanced motor control circuits.
7. Implement and integrate various types of motors in modern automation systems.
8. Apply sensors and control algorithms to design, build, and operate autonomous robots.
9. Demonstrate writing and debugging a control program.
10. Simulate and analyze circuits using advanced software tools.
11. Design and fabricate PCBs with modern software and processes.
12. Describe and use measurement tools and techniques for accurate diagnostics and testing, including an oscilloscope and a function generator.
13. Identify and use a multimeter to select DC or AC functions and ranges for measuring circuit values.
14. Demonstrate conducting advanced electronic measurements and waveform analysis.
15. Apply advanced soldering, assembly, and manufacturing techniques for electronic devices.
16. Describe the major components of a computer and their functions.
17. Explain the function and operation of an Arithmetic Logic Unit (ALU) in a computer system, including its role in performing arithmetic and logical operations, and its impact on overall computational performance.
18. Describe the characteristics, functions, and applications of various memory types, including ROM, RAM, PROM, EPROM, EEPROM, and EAPROM, and explain their roles in data storage and retrieval within computer systems.
19. Explain data buses and associated bandwidth, computer languages, and peripheral devices.
20. Identify types and explain uses of interface devices, e.g., chips and cards.

### Standard 9: Introduction to Electronics in Modern Digital Communication

Students will demonstrate foundational knowledge and skills in digital communication by applying principles of modulation, data protocols, and signal processing to design and analyze basic digital communication systems.

* Aligned Industry Recognized Credentials: ETA - Basic Systems Technician (BST)

#### Skills:

1. Explain the principles of digital modulation techniques, including Amplitude Modulation (AM), Frequency Modulation (FM), and Phase Modulation (PM), and their application in communication systems.
2. Describe common communication protocols and standards, such as TCP/IP, HTTP, and FTP, and their role in enabling effective data exchange across networks.
3. Explain digital signal processing (DSP) concepts, including basic filtering and error detection methods, and their importance in improving signal quality.
4. Define and apply fundamental data compression techniques, including lossless and lossy methods, to manage data storage and transmission efficiently.
5. Describe and explain basic network architectures and topologies, such as Local Area Networks (LANs) and Wide Area Networks (WANs), and their functions in digital communication systems.
6. Identify and explain the operation of common electronics display devices, including LCDs and LEDs, and describe their advantages and disadvantages.
7. Identify and explain why, in a common anode, seven-segment LED display, an individual LED will light when a negative voltage is applied to the segment's anode pin.
8. Describe the function and operation of LED remote hand units and opto-isolators, including their typical applications in circuits.
9. Identify uses of light-activated controls and explain how photo devices are incorporated into electronic systems.
10. Explain the major components and construction of home entertainment products, including microphones and speakers, and outline necessary precautions.
11. Compare high-quality and distorted sound and describe the electronic and acoustical reasons for each.
12. Explain signal conflicts and symptoms and describe methods for isolating troubles between discrete equipment units.
13. Describe the major types of two-way radio communications, including avionics, land mobile, and maritime systems, and explain their applications.
14. Examine the concept of data security in digital communication, including fundamental encryption and authentication methods to protect information.
15. Demonstrate use of simulation tools to model basic digital communication systems and understand their functionality.

### Standard 10: Advanced Integrated Circuits (ICs)

Students will be able to apply advanced concepts and techniques related to integrated circuits (ICs), including their design, usage, testing, and the latest trends in IC technology.

* Aligned Industry Recognized Credentials: ETA - Basic Systems Technician (BST)

#### Skills:

1. Analyze the structures and functions of complex IC architectures, including System on Chips (SoCs), Field Programmable Gate Arrays (FPGAs), and Application-Specific Integrated Circuits (ASICs) to make informed decisions when designing or selecting components for specific applications.
2. Evaluate factors influencing IC design, such as power consumption, thermal management, speed, and integration density.
3. Apply performance metrics like propagation delay, setup and hold times, and power dissipation.
4. Utilize Computer-Aided Design (CAD) tools for creating and simulating IC designs, including layout, schematic capture, and verification.
5. Develop custom IC designs based on specific requirements, including logic gates, amplifiers, and other functional blocks.
6. Apply industry-standard guidelines for IC design, including design rules and best practices for signal integrity and noise reduction.
7. Demonstrate testing on ICs using tools like oscilloscopes, logic analyzers, and signal generators to verify functionality and performance.
8. Demonstrate diagnosing and resolving common faults in ICs, such as stuck-at faults, timing issues, and signal integrity problems.
9. Identify and address various failure modes in ICs, including electrical overstress, thermal failure, and manufacturing defects.
10. Demonstrate research skills to identify recent advancements in IC technology, such as advancements in nanoelectronics, 3D ICs, and advanced packaging techniques.
11. Analyze and evaluate potential future developments in ICs, including quantum computing, neuromorphic ICs, and other innovative technologies.
12. Assess how advancements in IC technology are influencing various fields, including telecommunications, computing, and consumer electronics.

### Standard 11: Fundamentals of Embedded Electronics Systems

Students will be able to explain the fundamental concepts and applications of embedded systems, perform basic programming, and describe the importance of these systems in various applications.

* Aligned Industry Recognized Credentials: ETA - Basic Systems Technician (BST)

#### Skills:

1. Evaluate the essential features and applications of embedded systems across various industries, analyzing their impact and relevance.
2. Identify and explain the basic architecture of microcontrollers and microprocessors used in embedded systems.
3. Demonstrate creating and refining simple programs for microcontrollers, utilizing languages such as C/C++ or Python to solve programming challenges.
4. Apply advanced programming skills to design, write, and debug complex programs for microcontrollers, ensuring optimal performance and functionality.
5. Design and construct basic embedded systems using development boards, e.g., Arduino or Raspberry Pi, and standard hardware components like sensors, actuators, and displays.
6. Describe the fundamental concepts of Real-Time Operating Systems (RTOS), including task scheduling, priority management, and real-time constraints, and explain their importance in embedded system applications.
7. Demonstrate connecting embedded systems to external devices and use standard communication protocols like UART, SPI, or I2C.
8. Demonstrate testing and troubleshooting of embedded systems, ensuring their integration and functionality in practical applications.
9. Analyze and evaluate emerging trends in digital communication technologies, such as IoT, 5G, and advanced data analytics, and discuss their potential impact on the field.

## Employability Standards

### Standard 12: Employability Skills

Students will demonstrate an understanding of the importance of professional communication, critical thinking, problem-solving, professionalism, teamwork, and collaboration in electronics engineering technology careers.

#### Skills:

1. Apply effective communication skills to explain complex technical concepts clearly to non-technical stakeholders.
2. Demonstrate the ability to identify and meet the needs of clients or end-users while providing support and service throughout the project lifecycle.
3. Demonstrate the ability to analyze complex problems and develop effective solutions.
4. Demonstrate active listening skills by giving full attention to others, taking the time to understand their points, and asking appropriate questions to meet job expectations and production methods.
5. Demonstrate working effectively in teams to achieve common goals, coordinating with other professionals such as engineers, contractors, and project managers.

## Entrepreneurship Standards

### Standard 13: Entrepreneurship

Students will identify and evaluate entrepreneurship opportunities in the electronics industry by analyzing market potential, financial viability, and competitive advantages to assess the value proposition of business ownership.

#### Skills:

1. Conduct comprehensive market research to identify current trends and gaps and apply innovative thinking to develop and implement new electronics engineering technologies that address market needs.
2. Understand industry standards and regulations related to electronics to ensure product safety and legal compliance.
3. Demonstrate the flexibility to adapt to rapidly changing technologies and market conditions in the electronics industry.
4. Evaluate the licensing, regulatory, and tax implications of self-employment and business ownership compared to W-2 employment.

## Digital Literacy Standards

### Standard 14: Digital Literacy

Students will demonstrate the ability to plan, implement, and effectively use digital technologies to support the daily operations and professional responsibilities in electronics engineering technology.

#### Skills:

1. Demonstrate the ability to collaborate effectively through digital channels, including email, video conferencing, file-sharing platforms, and other messaging applications.
2. Demonstrate the use of spreadsheet and database management systems to organize, analyze, and interpret technical data, and document project information and test results.
3. Understand where to find online resources that support effective electronics engineering technology professionals and how to be a safe and ethical consumer and creator of digital content.
4. Understand principles of cybersecurity to protect sensitive information, maintain data integrity, and ensure secure communication within electronic systems and during project work.
5. Apply strategies for using digital tools and technology to drive business and commerce.