Florida Department of Education
Curriculum Framework

The standards and/or benchmarks for this program were updated for the 2026-27 academic year.

Program Title: **Electronic Systems Integration and Automation**
Program Type: **Career Preparatory**
Career Cluster: **Architecture and Construction**

Career Certificate Program		
Program Number	C700100	
CIP Number	0647010106	
Grade Level	30, 31	
Program Length	750 hours	
Teacher Certification	Refer to the **Program Structure** section.	
CTSO	SkillsUSA	
SOC Codes (all applicable)	For program SOC codes, please see the Program and Course Tables section of the CTE Program Resources page linked below.	
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml	
Basic Skills Level	Computations (Mathematics): 10	Communications (Reading and Language Arts): 10

Purpose

The purpose of this program is to prepare students for employment or advanced training in a variety of occupations in the Electronics Technology Integration industry.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Electronics Technology Integration industry.; technical and product skills, underlying principles of technology, planning, management, finance, labor issues, community issues and health, safety and environmental issues.

The content includes but is not limited to communication, leadership skills, human relations and employability skills; and safe, efficient work practices.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of three occupational completion points. A student who completes the applicable competencies at any occupational completion point may either continue with the training or become an occupational completer.

This program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44(3)(b), F.S.

To teach the courses listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the postsecondary program structure:

OCP	Course Number	Course Title	Teacher Certification	Length
A	EEV0240	Electronic System Technician	INFO TECH 7 G ELECTRONIC @7G TELCOM 7G	300 hours
B	EEV0241	Residential Electronic Systems Technician		300 hours
C	EEV0242	Commercial Electronic Systems Technician		150 hours

Florida's Career Readiness Skills for CTE Programs

Employability Skills	
01.0	Apply academic skills to workplace scenarios.
01.01	Use reading skills.
01.02	Use writing skills.
01.03	Use mathematical strategies and procedures.
01.04	Use scientific principles and procedures.
02.0	Design a solution to an industry problem.
02.01	Use critical thinking.
02.02	Use creativity.
02.03	Make sound decisions.
02.04	Solve problems.
02.05	Reason.
02.06	Plan and organize.
03.0	Manage resources within an industry project
03.01	Manage time.
03.02	Manage money or resources.
03.03	Manage materials.
03.04	Manage personnel.
04.0	Oversee the subcomponents, operations and output of a technical or organizational system.
04.01	Manage systems.
04.02	Monitor systems.
04.03	Improve systems.
05.0	Use information for decision making.
05.01	Locate information.
05.02	Organize information.
05.03	Use information.

	05.04 Analyze information.
	05.05 Communicate information.
06.0	Apply relevant technology to workplace scenarios to aid productivity.
	06.01 Use technology.
07.0	Interpret and express interpersonal communication.
	07.01 Communicate verbally.
	07.02 Listen actively.
	07.03 Comprehend written material.
	07.04 Convey information in writing.
	07.05 Communicate nonverbally.
	07.06 Interpret nonverbal communication.
08.0	Interact with others to accomplish workplace goals.
	08.01 Collaborate with others in a team.
	08.02 Respond to customer needs.
	08.03 Exercise leadership.
	08.04 Negotiate to resolve conflict.
	08.05 Respect others.
09.0	Manage personal behavior to maximize productivity and professional growth.
	09.01 Demonstrate responsibility and self-discipline.
	09.02 Adapt and show flexibility.
	09.03 Work independently.
	09.04 Demonstrate a willingness to learn.
	09.05 Demonstrate integrity.
	09.06 Demonstrate professionalism.
	09.07 Take initiative.
	09.08 Display positive attitude.
	09.09 Take responsibility for professional growth.

Job Attainment	
10.0	Find, assess and apply to job opportunities.
10.01	Identify online job posts relevant to his or her career aspirations.
10.02	Compare and contrast the job posts' required qualifications, job duties, compensation, benefits and employers.
10.03	Define what information, documentation and writing prompts are required for the positions.
11.0	Communicate personal competence, character and fit for a job opportunity.
11.01	Develop a resume.
11.02	Write a cover letter.
11.03	Curate a professional portfolio that includes work products.
11.04	Prepare for and experience a mock job interview.
12.0	Cultivate and leverage relationships to professionally advance.
12.01	Request a signed reference letter, letter of recommendation and/or an online skill/professionalism endorsement.
12.02	Develop a plan to cultivate a professional digital footprint.
12.03	Develop a networking plan for a specific industry of interest.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Identify differences between alternating current (AC) and direct current (DC).
02.0 Identify the parameters of and the differences in voltages (e.g., 12, 24, 120, 240, 277, 480, etc.).
03.0 Identify the four basic units of measurement used with electricity and explain how they relate in Ohm's Law.
04.0 Read and identify planning tools, including construction drawings and symbols on drawings.
05.0 Identify the various types of documentation tools and methods used on a job/project.
06.0 Interpret, create or modify job/project documentation as needed to comply with design specifications.
07.0 Use and maintain hand tools, power tools and test equipment in a manner that complies with OSHA requirements and general safety best practices.
08.0 Understand the fundamentals of common building construction methodologies (wood frame, metal frame, masonry, concrete, etc.) and how they affect the installation of electronic systems and cabling.
09.0 Identify and construct common cables used in electronic systems integration.
10.0 Use fasteners, anchors and back boxes to mount cable and other equipment to structures.
11.0 Identify applicable building codes.
12.0 Demonstrate applicable safety practices.
13.0 Define the electronic systems integration and automation industry.
14.0 Assemble and execute the pre-wire phase of installation.
15.0 Assemble and execute the trim-out phase of installation.
16.0 Design and construct racks and cabinets.
17.0 Mount system components used in electronics integration.
18.0 Connect and configure basic network infrastructure as it relates to electronics integration and automation.
19.0 Install and configure power devices and equipment.
20.0 Install and perform basic configuration of audio sub-systems.
21.0 Install and perform basic configuration of video sub-systems.
22.0 Explain the audio/video fundamentals of various specialty spaces (e.g., cinema room, media room, home office, etc.).
23.0 Install surveillance and security devices.
24.0 Install, connect, configure and test off-air/cable/satellite related devices.
25.0 Connect equipment related to integrated system control applications and understand basic control programming concepts.
26.0 Verify and test system to confirm proper operation and compliance with design specifications.
27.0 Explain the fundamentals of common residential sub-systems.
28.0 Identify the role and responsibilities of the system designer.
29.0 Apply the basics of project management.
30.0 Select and construct a gate operator and entry device.
31.0 Connect and configure basic network infrastructure as it relates to electronics integration and automation.
32.0 Connect and configure wireless networks for electronics integration and automation.
33.0 Describe the commercial applications of electronics integration and automation.
34.0 Understand how to install a commercial fire alarm system.

Florida Department of Education
Student Performance Standards

Program Title: Electronic Systems Integration and Automation
Career Certificate Program Number: C700100

Course Number: EEV0240 **Occupational Completion Point: A** **Electronic Systems Technician – 300 Hours**	
01.0	Identify differences between alternating current (AC) and direct current (DC). The student will be able to:
01.01	Explain basics of electrical distribution. (Optional)
01.02	Describe the fundamentals of AC and DC electricity.
01.03	Describe the distribution of AC and DC.
01.04	Identify the difference between single phase and three phase power. (Optional)
02.0	Identify the parameters of and the differences in voltages (e.g., 12, 24, 120, 240, 277, 480, etc.). The student will be able to:
02.01	Explain the differences in and the relationship between voltage and current; understand the implications of limiting one versus the other and how this applies to the distinctions between types of work.
02.02	Identify the difference between Class 1, Class 2 and Class 3 circuits, including voltage differences.
03.0	Identify the four basic units of measurement used with electricity and explain how they relate in Ohm's Law. The student will be able to:
03.01	Understand the basic algebra required for using Ohm's Law.
03.02	Describe the difference between watts, amperes, volts and ohms.
03.03	Apply Ohm's law and power formulas.
03.04	Explain the difference between resistance and impedance and identify resistors by their color code.
03.05	Categorize the different types of non-color coded resistors, capacitors, coils, chokes, inductors, and transformers.
03.06	Describe the relationship between inductance, capacitance, and reactance as they relate to impedance.
03.07	Calculate impedance of both series and parallel circuits.
04.0	Read and identify planning tools, including construction drawings and symbols on drawings. The student will be able to:
04.01	Describe different types of construction drawings.

	04.02 Identify symbols commonly used on construction drawings, as referenced in ANSI J-STD-710-2015: Audio, Video and Control Architectural Drawing Symbols Standard.
05.0	Identify the various types of documentation tools and methods used on a job/project. The student will be able to:
	05.01 Identify and explain the purpose of the following documentation tools: • Construction drawings • Cable schedule • Work order • Change order • Materials delivery/shipper • Time sheet • Rack/Cabinet layout drawing • Block diagram • Schematic • Software • Safety data sheets (SDS) • Punch list • As-built diagrams
	05.02 Read and interpret common company documents and typical field documents.
06.0	Interpret, create or modify job/project documentation as needed to comply with design specifications. The student will be able to:
	06.01 Create necessary job/project documentation and modify using approved methods.
	06.02 Use appropriate job/project tracking/reporting methods.
07.0	Use and maintain hand and power tools and test equipment in a manner that complies with OSHA requirements and general safety best practices. The student will be able to:
	07.01 Safely use and maintain common hand and power tools and test equipment used in electronics integration, in accordance with OSHA standards and best practices.
	07.02 Understand and apply safety practices for fall protection when using scaffolding and ladders.
08.0	Understand the fundamentals of common building construction methodologies (wood frame, metal frame, masonry, concrete, etc.) and how they affect the installation of electronic systems and cabling. The student will be able to:
	08.01 Identify electronic systems and cabling installation practices for various applications depending on the construction methodology (e.g., cable raceways and conduit in masonry, drilling pathways in framing, etc.).
	08.02 Explain and follow applicable codes/laws pertaining to the installation.
	08.03 Analyze various electronic systems and cabling installation scenarios (framing vs. concrete/masonry) and choose/apply the correct solution; troubleshoot any issues.

	08.04 Explain the differences between residential and commercial applications, including occupancies, and how these affect the design and installation of integrated systems.
09.0	Identify and construct common cables used in electronic systems integration. The student will be able to:
	09.01 Identify and construct/terminate the following connections: • RJ-45 (aka. 8P8C) • RJ-11 (aka. 6P4C) • RJ-25 (aka. 6P6C) • RJ-31x • Coax F • BNC • RCA • Terminal Block (aka. Captive Screw) • Solderless (e.g., forked, ring or spade) • Component Video • XLR • Fiber Optic Connections • Phone Plugs - standard, mini, sub-mini (e.g., TS, TRS, TRRS) • Speaker (e.g., banana plugs, binding posts) • Euroblock (aka. phoenix) • Crimp (e.g., jelly, beanies; aka. beans, dolphins) • IDC Insulation Displacement (e.g., 110 blocks, modular/keystone jacks, 66 blocks, krone blocks) • Speaker Twist (aka. speakON) • Soldered
	09.02 Define common connector color codes for telephone, speakers, data and video according to standards TIA-568 and ANSI/CTA/CEDIA-2030-A Multi-Room Audio Cabling Standard.
10.0	Use fasteners, anchors and back boxes to mount cable and other equipment to structures. The student will be able to:
	10.01 Properly use the following: • Cable fasteners • Cable trays and raceways • Threaded fasteners • Mechanical fasteners • Power actuated tool fasteners • Epoxy anchoring system
	10.02 Install boxes, mud rings, cable hangers, speaker rings, stub outs and ties at appropriate heights and locations
	10.03 Demonstrate an understanding of static vs. dynamic load requirements.

	10.04 Understand the load capacity of the entire system that will support the installed devices, including the materials being mounted to.
11.0	Identify applicable building codes. The student will be able to:
	11.01 Describe what National Electric Code (NEC) is and how it affects the integrated systems industry.
	11.02 Identify sections in the National Electric Code (NEC) that are applicable to low-voltage installations.
	11.03 Describe how applicable codes and the latest code changes affect job site operations.
	11.04 Identify items that can be regulated by federal, state, county, local/other codes, and Home Owners Associations (HOAs).
	11.05 Understand the application of the International Building Code (IBC) and the International Residential Code (IRC) as they relate to hole size & cable pathways in various structural members and building materials.
12.0	Demonstrate applicable safety practices. The student will be able to:
	12.01 Complete an OSHA 10 or an OSHA 30 Construction Industry training.
	12.02 Apply proper safety practices for electrical shock, personal protection, lifting, ladders, scaffolding and first aid.
13.0	Define the electronic systems integration and automation industry. The student will be able to:
	13.01 Explain the definition and scope of the industry, including its history, trends and the most commonly installed sub-systems.
	13.02 Identify the different company types including integrators, retailers, distributors, manufacturer reps, manufacturers and specialty designers.
	13.03 Identify common project stakeholders including clients, architects, interior designers, builders and other trade professionals.
	13.04 Identify the different career paths in the electronics integration and automation field.
	13.05 Identify appropriate industry organizations, such as AVIXA, CEDIA, NSCA, TIA, BICSI, etc.

Course Number: EEV0241 Occupational Completion Point: B Residential Electronic Systems Technician – 300 Hours	
14.0	Assemble and execute the pre-wire phase of installation. The student will be able to:
	14.01 Identify different cabling topologies used in electronic systems integration, including specs of TIA-570-D standard.
	14.02 Pre-wire, label cables, and comply with codes and industry standards when installing an electronic system as specified in order to facilitate proper performance of audio, video, control and related subsystem devices.
	14.03 Utilize basic EMT and PVC conduit installation methods, including bending.

	14.04 Install and secure cables using industry recommended practices for bend radius, service loop length, support span, and mounting height.
15.0	Assemble and execute the trim-out phase of installation. The student will be able to:
	15.01 Label installed cabling.
	15.02 Trim-out an electronic system by labeling, terminating and testing cables and properly mounting and installing trim related devices in order to support installation of audio, video, control and other subsystem devices.
16.0	Design and construct racks and cabinets. The student will be able to:
	16.01 Describe the difference between a rack and cabinet.
	16.02 Install equipment into a rack or cabinet using proper cable management.
	16.03 Install equipment into a rack or cabinet while providing for proper ventilation, power management, mounting, ergonomics and safety.
17.0	Mount system components used in electronics integration. The student will be able to:
	17.01 Explain retrofitting, safety considerations, and assuring that UL standards are not changed and NEC codes are not violated during retrofit.
	17.02 Identify appropriate mounting hardware.
	17.03 Mount system components such as cameras, flat panel displays and projectors by installing the proper brackets, housings and mounting hardware in order to provide proper performance and safety.
18.0	Connect and configure basic network infrastructure as it relates to electronics integration and automation. The student will be able to:
	18.01 Set up basic telephone devices such as handsets and intercoms in order to establish basic voice communication.
	18.02 Set up basic data network devices such as switches and routers in order to facilitate basic data communication.
	18.03 Install communications cabling using industry standards and recommended practices in order to create a robust, reliable network infrastructure.
	18.04 Perform the required level of cabling test procedures in order to ensure system performance meets or exceeds design specifications and client expectations.
	18.05 Secure the infrastructure by evaluating and fortifying all network cabling locations (patch panels, wiring drops, network interface devices, etc.) in order to ensure client privacy and information security.
	18.06 Design a wired and/or wireless network infrastructure using appropriate communications cabling that meets the performance requirements of the client in order to ensure long term operation and reliability.
19.0	Install, connect and configure power devices and equipment. The student will be able to:
	19.01 Explain basics of electrical distribution. (Optional)

	19.02 Install power management devices such as surge protection devices, battery backups and power conditioners in order to ensure safe and maximized performance of installed systems.
20.0	Install and perform basic configuration of audio sub-systems. The student will be able to:
	20.01 Define audio terminology.
	20.02 Explain audio signal and interconnects (analog and digital).
	20.03 Set up audio devices such as sources, amplifiers and speakers in order to produce a desired listening experience.
21.0	Install and perform basic configuration of video sub-systems. The student will be able to:
	21.01 Define video terminology.
	21.02 Explain video signal and interconnects.
	21.03 Describe the functions of High Definition Multimedia Interface (HDMI) and how it works.
	21.04 Set up video devices such as sources and displays, in order to produce a desired viewing experience.
22.0	Explain the audio/video fundamentals of various specialty spaces (e.g., cinema room, media room, home office, etc.). The student will be able to:
	22.01 Explain design considerations and performance goals of specialty spaces.
	22.02 Describe the basic layout and configuration of a specialty space.
	22.03 Install speakers at proper locations to conform with common surround sound layouts.
	22.04 Describe the relationship between screen size and viewing distance.
	22.05 Install projection system to ensure proper image size and geometry.
23.0	Install surveillance and security devices. The student will be able to:
	23.01 Install basic security and surveillance devices (e.g., cameras, sensors, central control panels, keypads, etc.) in order to provide basic monitoring of secured areas.
	23.02 Configure basic security and surveillance devices to ensure proper working order.
	23.03 Configure basic security and surveillance devices to include on-site storage devices and/or cloud-based platforms.
24.0	Install, connect, configure and test off-air/cable/satellite related devices. The student will be able to:
	24.01 Install terrestrial antenna, cable and satellite TV systems, distribution and equipment to ensure signal reception.

	24.02 Configure terrestrial antenna, cable and satellite TV systems, distribution and equipment in order to provide proper reception of TV signals.
25.0	Connect equipment related to integrated system control applications and understand basic control programming concepts. The student will be able to:
	25.01 Define control system protocols.
	25.02 Connect common control devices such as remotes, keypads, volume controls, touch screens, relays, and control processors/communication bridging devices.
	25.03 Explain the differences between control and automation.
	25.04 Describe the three common types of user interfaces, Tangible (TUIs), Graphic (GUIs), and Natural (NUIs).
	25.05 Explain the concept of a macro command.
26.0	Verify and test system to confirm proper operation and compliance with design specifications. The student will be able to:
	26.01 Review the installed system in order to confirm compliance with design specifications.
	26.02 Verify system performance by testing device and system functionality in order to confirm proper operation.
	26.03 Troubleshoot installation and sub-station issues.
27.0	Explain the fundamentals of common residential sub-systems. The student will be able to:
	27.01 Describe the fundamentals of automated lighting components and operation.
	27.02 Describe the fundamentals of motorized devices such as shades, lifts, mounts, etc.
	27.03 Describe the fundamentals of energy monitoring and management.

Course Number: EEV0242 **Occupational Completion Point: C** **Commercial Electronic Systems Technician – 150 Hours**	
28.0	Identify the role and responsibilities of the system designer. The student will be able to:
	28.01 Explain the steps in the design process.
	28.02 Explain the role of the designer.
29.0	Apply the basics of project management. The student will be able to:

	29.01 Explain the life cycle of a project.
	29.02 Explain the role of the project manager.
	29.03 Explain and define standard project management terms.
	29.04 Develop a project scope statement.
30.0	Select and construct a gate operator and entry device. The student will be able to:
	30.01 Identify appropriate gate operator for a given installation.
	30.02 Identify appropriate entry device for a given installation.
	30.03 Evaluate, design and construct an entry gate system for a given installation.
31.0	Connect and configure basic network infrastructure as it relates to electronics integration and automation. The student will be able to:
	31.01 Install communications cabling using industry standards and recommended practices in order to create a robust, reliable network infrastructure.
	31.02 Perform the required level of cabling test procedures in order to ensure system performance meets or exceeds design specifications and client expectations.
	31.03 Secure the infrastructure by evaluating and fortifying all network cabling locations (patch panels, wiring drops, network interface devices, etc.) in order to ensure client privacy and information security.
	31.04 Design a wired network infrastructure using appropriate communications cabling that meets the performance requirements of the client in order to ensure long term operation and reliability.
	31.05 Perform basic configuration (e.g., IP settings, SSID, basic security, etc.) for common network devices such as switches, routers and access points to support the performance requirements of all client devices in order to ensure proper functionality and long term reliability.
32.0	Connect and configure wireless networks for electronics integration and automation. The student will be able to:
	32.01 Survey and analyze the RF spectrum using available wireless networking tools in order to ensure performance and troubleshoot problems in a commercial environment.
	32.02 Apply knowledge of existing wireless communication protocols (802.11a/b/g/n/ac) in order to specify the proper hardware in a commercial wireless networking application.
	32.03 Ensure reliability, security and consistent performance of the wireless portion of a commercial network by proper configuration of the service set identifier (SSID), channel, encryption standards and security settings.
	32.04 Explain important considerations such as throughput, coverage areas, and client roaming when installing multiple access points
33.0	Describe the commercial applications of electronics integration and automation. The student will be able to:
	33.01 Describe common integrated system applications deployed in commercial environments.

	33.02	Explain common considerations for various types of conference room applications (e.g., huddle spaces, small meeting rooms, training facilities, large event spaces, boardroom spaces, etc.).
	33.03	Identify upcoming trends and technology in the electronics systems integration and automation industry.
	33.04	Explain the basic functionality of commercial security and alarm applications.
	33.05	Explain the different types of access control, including user level administration/management for commercial applications.
	33.06	Explain the different types of large scale video distribution technologies.
34.0	Understand how to install a commercial fire alarm system. The student will be able to:	
	34.01	Understand how to install and address initiating devices (e.g., detectors, sensors, pull stations etc.).
	34.02	Understand how to install and address signaling devices (e.g., horns, strobes, speakers, etc.).
	34.03	Understand how to install and configure fire alarm panels.
	34.04	Understand and explain fire suppression systems and common methods used. (Optional)
	34.05	Understand how to test the fire alarm system.
	34.06	Understand how the fire alarm system integrates with other commercial applications.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

CTSOs are co-curricular career and technical student organizations providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. Other CTSOs not listed in this curriculum framework or recognized by the Florida Department of Education are permissible provided they support student mastery over the standards and benchmarks of this curriculum framework.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Basic Skills

In Career Certificate Programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Computation (Mathematics) and Communications (Reading and Language Arts). These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination.

Adult students with disabilities, as defined in Section 1004.02, Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01, F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College System Institution must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91, F.S.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as

instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.
Note: postsecondary curriculum and regulated secondary programs cannot be modified.