Florida Department of Education
Curriculum Framework

Program Title: **Building Construction Technologies**
Program Type: **Career Preparatory**
Career Cluster: **Architecture & Construction**

Career Certificate Program		
Program Number	I460401	
CIP Number	0646041502	
Grade Level	30, 31	
Program Length	1050 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): 9	Communications (Reading and Language Arts): 9

Purpose

The purpose of this program is to prepare students for employment or advanced training in the building construction industry.

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Architecture & Construction career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills and occupation-specific skills, and knowledge of all aspects of the Architecture & Construction career cluster.

The content includes but is not limited to developing skills in various construction trades, as well as providing a foundation in construction management.

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 two occupational completion points.

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	BCV0400	Building Construction Helper	AC HEAT ME @7 7G BLDG CONST @7 7G BLDG MAINT @7 7G CARPENTRY @7 7G DRAFTING @7 7G ELECTRICAL @7 7G ENG 7G PLUMBIN @7 7G SHEETMETAL @7 7G TEC CONSTR @7 7G TEC DRAFT 7G TROWEL TR 7G	450 Hours
B	BCV0401	Building Construction Technician 1		300 Hours
	BCV0402	Building Construction Technician 2		300 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 Demonstrate the importance of health, safety and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
02.0 Investigate the construction industry and explore related occupations.
03.0 Select and use basic hand tools.
04.0 Select and use power tools and describe their proper operation.
05.0 Demonstrate mathematics knowledge and skills.
06.0 Read and interpret construction drawings.
07.0 Frame floor systems based on drawing and specification requirements.
08.0 Frame walls and ceilings based on drawing and specification requirements.
09.0 Frame a roof based on drawing and specification requirements.
10.0 Analyze construction components, materials, hardware and characteristics.
11.0 Demonstrate masonry skills.
12.0 Erect, plumb and brace a simple concrete form with reinforcement.
13.0 Place concrete.
14.0 Demonstrate welding knowledge and skills (Optional).
15.0 Understand construction documents, contract documents and specifications.
16.0 Select the appropriate heavy equipment for a given task. (Optional)
17.0 Identify local, state and federal codes and regulations.
18.0 Perform site preparation and maintenance.
19.0 Estimate project costs and schedule construction activities for a specific job.
20.0 Investigate sustainability issues related to the design, construction and maintenance of the built environment.
21.0 Complete a construction project using skills learned in the program.
22.0 Install roofing materials.
23.0 Install exterior finishes.
24.0 Explain the importance of employability and entrepreneurship skills.
25.0 Demonstrate interior carpentry skill.
26.0 Install cabinets.
27.0 Prepare and apply finishes to surfaces.
28.0 Build stairs.
29.0 Troubleshoot, repair and install plumbing systems.
30.0 Demonstrate knowledge of Drain, Waste and Vent (DWV) systems.
31.0 Measure, cut and join plastic piping.
32.0 Properly measure, ream, cut and join copper piping.
33.0 Demonstrate electrical safety.
34.0 Troubleshoot, repair and install electrical systems.
35.0 Research the Heating, Ventilation and Air-Conditioning (HVAC) profession.
36.0 Maintain, repair and install HVAC systems.

Florida Department of Education
Student Performance Standards

Program Title: Building Construction Technologies
Career Certificate Program Number: I460401

Course Number: BCV0400 **Occupational Completion Point: A** **Building Construction Helper – 450 Hours**	
01.0	Demonstrate the importance of health, safety and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. The student will be able to:
01.01	Understand the role and the purpose of the Occupational Safety and Health Administration (OSHA) rules and regulations.
01.02	Identify and locate Safety Data Sheets (formerly called Material Safety Data Sheets (MSDS)) and follow the procedures as necessary.
01.03	While using a safety data sheet, identify health-related problems that may result from exposure to work-related chemicals and hazardous materials, and demonstrate knowledge of the proper precautions required for handling such materials.
01.04	Describe "Right-to-Know" Law as recorded in (29 CFR-1910.1200)
01.05	Identify and use safety equipment and personal protective equipment (PPE).
01.06	Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments.
01.07	Explain emergency procedures to follow in response to workplace accidents.
02.0	Investigate the construction industry and explore related occupations. The student will be able to:
02.01	Demonstrate an understanding of the relationship between construction and the environment.
02.02	Describe the role of trade unions in the construction industry.
02.03	Research apprenticeship opportunities.
02.04	Identify the different classifications of construction projects.
02.05	Define the roles and responsibilities of the general contractor, specialty contractor, construction management and design build firms.
02.06	Research construction trade occupations and the roles and responsibilities of each craft.
02.07	Research construction management occupations and the roles and responsibilities of each.
02.08	Identify design and engineering occupations and the roles and responsibilities of each.

	02.09 Describe the process of applying for building permits and variances.
	02.10 Explain the importance of zoning requirements.
03.0	Select and use basic hand tools. The student will be able to:
	03.01 Identify, select and use appropriate hammers used in the construction industry.
	03.02 Identify, use and select saws to cut material.
	03.03 Identify and use various common screwdriver types.
	03.04 Select and use various types of non-adjustable wrenches, adjustable wrenches and plumbing tools, chisels and punches, pliers, ripping bars and nail pullers, woodworking files, spirit levels, socket wrench sets, hand or block sanders, carpenters' squares, utility knives, clamps and shovels.
04.0	Select and use power tools and describe their proper operation. The student will be able to:
	04.01 Identify power tools including sanders, drills, circular saws, jig saws, reciprocating saws, radial-arm saws, table saws, band saws (optional), miter saws, drill presses (Optional), grinders, electric routers and pneumatic nailers.
	04.02 Identify and use various types of drill bits.
	04.03 Describe the proper operation of power tools and equipment.
05.0	Demonstrate mathematics knowledge and skills. The student will be able to:
	05.01 Solve job-related problems by adding, subtracting, multiplying and dividing numbers, using fractions, decimals and whole numbers.
	05.02 Change numbers to percentages.
	05.03 Demonstrate knowledge of arithmetic operations.
	05.04 Read a ruler and a tape measure.
	05.05 Compute feet, inches and yards.
	05.06 Change hours and minutes to decimals (Optional), fractions and mixed numbers.
	05.07 Analyze and apply data and measurements to solve problems and interpret documents.
	05.08 Determine ratios and proportions.
	05.09 Convert decimals to fractions and fractions to decimals.
	05.10 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares and cylinders.

06.0	Read and interpret construction drawings. The student will be able to:
	06.01 Identify basic construction drawing terms, components and symbols, and where to locate these on the drawings.
	06.02 Locate sections, elevations and details to their location on the plan view.
	06.03 Use drawing dimensions to lay out a construction project.
	06.04 Interpret and use architectural scales.
07.0	Frame floor systems based on drawing and specification requirements. The student will be able to:
	07.01 Identify floor and sill framing and support members.
	07.02 Name the methods used to fasten sills to the foundation.
	07.03 Understand how girder/beam and joist sizes are selected.
	07.04 Identify different types of floor joists.
	07.05 Identify different types of bridging.
	07.06 Identify different types of flooring materials.
	07.07 Explain the purposes of subflooring and underlayment.
	07.08 Match selected fasteners used in floor framing to their correct uses.
	07.09 Estimate the amount of material needed to frame a floor assembly.
	07.10 Demonstrate the ability to:
	• Lay out and construct a floor assembly
	• Install bridging (wood cross bridging, solid wood bridging and steel cross bridging).
	• Install joists for a cantilever floor.
	• Install a subfloor using butt-joint plywood/OSB panels and structural panels.
	• Install a single floor system using tongue-and-groove plywood/OSB panels.
08.0	Frame walls and ceilings based on drawing and specification requirements. The student will be able to:
	08.01 Identify the components of a wall and ceiling layout.

	08.02 Lay out a wood frame wall, including plates, corner posts, door and window openings, partition T's, bracing and the use of fire stops where applicable.
	08.03 Identify the common materials and methods used for installing sheathing on walls.
	08.04 Demonstrate the ability to dry in a structure (i.e., Building wrap, paper, taping, etc.).
	08.05 Lay out, assemble, erect and brace exterior walls for a frame building.
	08.06 Describe wall framing techniques used in masonry construction.
	08.07 Explain or demonstrate the use of metal studs in wall framing.
	08.08 Layout, cut and install ceiling joists on a wood frame building.
	08.09 Estimate the materials required to frame walls and ceilings.
09.0	Frame a roof based on drawing and specification requirements. The student will be able to:
	09.01 Understand the terms associated with roof framing.
	09.02 Identify the roof framing members used in gable and hip roofs.
	09.03 Calculate the length of a rafter using various methods.
	09.04 Identify the various types of trusses used in roof framing.
	09.05 Use a rafter framing square, speed square and calculator in laying out a roof.
	09.06 Identify various types of sheathing used in roof construction.
	09.07 Frame a gable roof with vent openings.
	09.08 Frame a roof opening.
	09.09 Erect a gable roof using trusses.
	09.10 Estimate the materials used in framing and sheathing a roof.
10.0	Analyze construction components, materials, hardware and characteristics. The student will be able to:
	10.01 Identify the components of various kinds of structures including slabs and foundations, interior and exterior walls, roofs and flooring systems.
	10.02 Identify the types of wall sections.

	10.03 Identify the types and installation procedures of roof, wall and floor sheathing.
	10.04 Identify various roof supports.
11.0	Demonstrate masonry skills. The student will be able to:
	11.01 Describe the most common types of masonry units.
	11.02 Describe how to set up and plumb a wall.
	11.03 Describe the transformation pattern (i.e., different brick pattern, floor tile, plywood on floor, vinyl siding, etc.).
	11.04 Lay a dry bond.
	11.05 Spread and furrow a bed joint and butter masonry units.
	11.06 Describe the different types of masonry bonds.
	11.07 Cut brick and block accurately.
	11.08 Select the tools and equipment used for mixing mortar.
	11.09 Describe the factors that affect the consistency of mortar.
	11.10 Identify the common ratios (M, N, S and O) of mortar mixtures.
	11.11 Identify pointing tools and strike mortar joints.
	11.12 Repoint old work.
	11.13 Prepare a work area, protecting adjacent areas.
	11.14 Use various methods of putting up the line.
	11.15 Identify and use the various types of trowels.
	11.16 Identify and use the various types of caulking and application.
	11.17 Demonstrate the procedures for stucco application and repair.
	11.18 Mix various types of stucco.
	11.19 Identify, select, use and maintain tools, materials and equipment used in masonry.
	11.20 Use safe and proper procedures for cleaning equipment, materials, work areas and worker.

12.0	Erect, plumb and brace a simple concrete form with reinforcement. The student will be able to:
	12.01 Identify the properties of cement.
	12.02 Understand the various types of concrete, considering application and Pounds per Square Inch (PSI) strength.
	12.03 Describe the composition of concrete.
	12.04 Perform volume estimates for concrete quantity requirements.
	12.05 Identify types of concrete reinforcement materials and describe their uses.
	12.06 Identify various types of footings and explain their uses.
	12.07 Identify the parts of various types of forms.
	12.08 Construct various types of concrete forms.
	12.09 Describe in-beds used in concrete formwork.
	12.10 Identify appropriate form stripping and handling techniques.
	12.11 Explain the safety procedures associated with the construction and use of concrete forms.
13.0	Place concrete. The student will be able to:
	13.01 Describe how to slump test concrete before placement.
	13.02 Identify equipment used to transport and place concrete.
	13.03 Identify, select and use concrete tools.
	13.04 Place and consolidate concrete into forms.
	13.05 Strike off and level concrete using a screed.
	13.06 Use tools to place, float and finish concrete.
	13.07 Determine when conditions permit the concrete finishing operation to start.
	13.08 Name the factors that affect the curing of concrete and describe the methods used to achieve proper curing.
14.0	Demonstrate welding knowledge and skills. (Optional) The student will be able to:
	14.01 Identify welding and cutting hazards and how to avoid or minimize them in the workplace.

	14.02 Identify and demonstrate the proper use of cutting and welding equipment [e.g., Oxy-Fuel, Plasma Arc, Shielded Metal Arc Welding (SMAW), Gas-Metal Arc Welding (GMAW), Gas-Tungsten Arc Welding (GTAW)].
15.0	Understand construction documents, contract documents and specifications. The student will be able to:
	15.01 Explain the purpose and components of contract documents and specifications.
	15.02 Read, interpret and apply plans, elevations, sections and details.
	15.03 Explain the relationships of the elements of contract documents.
	15.04 Create lists of materials and prepare estimates.
	15.05 Use architectural and engineering scales.
	15.06 Compare various Computer-Aided Drafting (CAD) and Building Information Modeling (BIM) products and how they can be used by designers and construction project managers. (optional)
	15.07 Compare and analyze traditional drafting with CAD and BIM systems. (Optional)
	15.08 Identify and use technology and other resources to assist with design decisions.
16.0	Select the appropriate heavy equipment for a given task. (Optional) The student will be able to:
	16.01 Identify different types and uses of heavy equipment.
	16.02 Describe the operations of different types of heavy equipment.
17.0	Identify local, state and federal codes and regulations. The student will be able to:
	17.01 Identify and locate local, state and federal codes, regulations and standards.
	17.02 Identify local, state and federal regulatory agencies.
18.0	Perform site preparation and maintenance. The student will be able to:
	18.01 Understand zoning requirements.
	18.02 Understand property lines and building setbacks.
	18.03 Understand grades and elevations.
	18.04 Understand the need to add, remove or relocate fill to proper compaction.
	18.05 Lay out and mark building locations and elevations.

	18.06 Clean and maintain the site.
19.0	Estimate project costs and schedule construction activities for a specific job. The student will be able to:
	19.01 Calculate material quantities and purchase cost (including sales tax).
	19.02 Calculate labor costs including work hours, duration and cost of workers.
	19.03 Explain and compute federal, state and local taxes.
	19.04 Schedule various construction activities (i.e., timeframes, workers & special equipment).
20.0	Investigate sustainability issues related to the design, construction and maintenance of the built environment. The student will be able to:
	20.01 Describe the impact of the construction industry on the natural environment.
	20.02 Recommend sustainable alternatives to conventional construction practices.
	20.03 Identify specific practices that can lessen adverse impacts on the environment.
	20.04 Understand holistic green and LEED (Leadership in Energy and Environmental Design) construction.
21.0	Complete a construction project using skills learned in the program. The student will be able to:
	21.01 Create a 3-dimensional representational or abstract model.
	21.02 Demonstrate imaginative or innovative solutions for a design project.
	21.03 Develop competence and dexterity through practice in the use of processes, tools and techniques.
	21.04 Apply critical-thinking and problem solving skills used in design and construction to develop solutions for real-life issues.
	21.05 Use and maintain tools and equipment to facilitate the design and construction process.
	21.06 Work in a project team to show cohesiveness, team building, respectful compromise and time-management skills.

Course Number: BCV0401 **Occupational Completion Point:** **Building Construction Technician 1 – 300 Hours**	
22.0	Install roofing materials. The student will be able to:
	22.01 Identify and explain different types of roofing systems and applications.

	22.02 Install various types of shingles.
	22.03 Install roof gutters and downspouts.
	22.04 Seal pipes and vents on roofs.
	22.05 Identify installation procedures for sheet metal roofs, built-up roofs and roof flashing.
23.0	Install exterior finishes. The student will be able to:
	23.01 Describe the purpose of wall insulation and flashing.
	23.02 Install common cornices.
	23.03 Estimate lap and panel siding.
	23.04 Describe the types and applications of various types of siding (i.e., wood, fiber-cement, vinyl, metal, stucco, masonry, etc.).
	23.05 Install siding.
24.0	Explain the importance of employability and entrepreneurship skills. The student will be able to:
	24.01 Identify and demonstrate positive work behaviors needed to be employable.
	24.02 Develop personal career plan that includes goals, objectives and strategies.
	24.03 Examine licensing, certification and industry credentialing requirements.
	24.04 Maintain a career portfolio to document knowledge, skills and experience.
	24.05 Evaluate and compare employment opportunities that match career goals.
	24.06 Identify and exhibit traits for retaining employment.
	24.07 Identify opportunities and research requirements for career advancement.
	24.08 Research the benefits of ongoing professional development.
	24.09 Examine and describe entrepreneurship opportunities as a career planning option.
25.0	Demonstrate interior carpentry skill. The student will be able to:
	25.01 Install interior finish materials (i.e., wood trim, drywall, floor/wall tile, acoustic tile, etc.).
	25.02 Install and trim exterior and interior doors and windows.

26.0	Install cabinets. The student will be able to:
	26.01 Identify the parts of a cabinet.
	26.02 Identify the types of cabinet door installation.
	26.03 Identify the types of cabinet hardware.
	26.04 Install cabinets and hardware.
27.0	Prepare and apply finishes to surfaces. The student will be able to:
	27.01 Erect an extension ladder and a scaffold.
	27.02 Prepare the surfaces.
	27.03 Apply finished coatings to surfaces with a roller, brush and sprayer.
28.0	Build stairs. The student will be able to:
	28.01 Identify various types and parts of stairs.
	28.02 Identify materials used in the construction of stairs.
	28.03 Interpret construction drawings of stairs.
	28.04 Calculate the total rise, the number and size of the risers and treads required for a stairway.
	28.05 Lay out and cut stringers, risers and treads.
Course Number: BCV0402 **Occupational Completion Point: B** **Building Construction Technician 2 – 300 Hours**	
29.0	Troubleshoot, repair and install plumbing systems. The student will be able to:
	29.01 Troubleshoot, repair and install bathroom fixtures and hardware such as lavatories, water closets, urinals, showers, bathtubs, traps and Drain, Waste and Vent (DWV) systems.
	29.02 Troubleshoot, repair and install kitchen fixtures and hardware, such as sinks, garbage disposals, faucets and hot water heaters.
	29.03 Identify and install various pipes and tubing used in the plumbing trade.
	29.04 Test and inspect plumbing systems.

30.0	Demonstrate knowledge of Drain, Waste and Vent (DWV) systems. The student will be able to:
	30.01 Explain how waste moves from a fixture through the drain system to the environment.
	30.02 Identify the major components of a drainage system and describe their functions.
	30.03 Identify the different types of traps and their components.
	30.04 Explain the importance of traps and identify the ways that traps can lose their seals.
	30.05 Identify the various types of DWV fittings and describe their applications.
	30.06 Identify significant code and health issues, violations and consequences related to DWV systems.
31.0	Measure, cut and join plastic piping. The student will be able to:
	31.01 Identify types of materials and schedules of plastic piping.
	31.02 Identify proper and improper applications of plastic piping.
	31.03 Identify types of fittings and valves used with plastic piping.
	31.04 Identify and determine the kinds of hangers and supports needed for plastic piping.
	31.05 Identify the various techniques used in hanging and supporting plastic piping.
	31.06 Explain proper procedures for the handling, storage and protection of plastic pipes.
32.0	Properly measure, ream, cut and join copper piping. The student will be able to:
	32.01 Identify the types of materials and schedules used with copper piping.
	32.02 Identify the material properties, storage and handling requirements of copper piping.
	32.03 Identify the types of fittings and valves used with copper piping.
	32.04 Identify and demonstrate the techniques used in hanging and supporting copper piping.
	32.05 Identify the hazards and safety precautions associated with copper piping.
33.0	Demonstrate electrical safety. The student will be able to:
	33.01 Identify electrical hazards and how to avoid or minimize them in the workplace.
	33.02 Explain safety issues concerning lockout/tag-out procedures, confined space entry, respiratory protection and fall protection systems.

	33.03 Develop a task plan and hazard assessment for a given task and select the appropriate Personal Protective Equipment (PPE) and work methods.
	33.04 Explain the role of the National Electric Code.
34.0	Troubleshoot, repair and install electrical systems. The student will be able to:
	34.01 Explain basic electrical theory.
	34.02 Explain branch circuit systems.
	34.03 Identify and explain service-entrance equipment.
	34.04 Identify and explain Ground Fault Circuit Interrupter (GFCI) circuitry.
	34.05 Troubleshoot electrical systems, using testing and metering devices.
	34.06 Install electrical outlets, switches and light fixtures.
	34.07 Install and replace breakers (and fuses, if applicable - optional).
	34.08 Identify types of wiring raceways.
	34.09 Test and inspect electrical systems.
	34.10 Identify alternative energy sources (i.e., solar, wind, mechanical, thermal, etc.).
35.0	Research the Heating, Ventilation and Air-Conditioning (HVAC) profession. The student will be able to:
	35.01 Explain what the Clean Air Act means to the HVAC profession.
	35.02 Describe regulatory codes relevant to the HVAC industry.
36.0	Maintain, repair and install HVAC systems. The student will be able to:
	36.01 Explain heating and cooling principles and code requirements.
	36.02 Describe various methods of calculating heating and cooling loads.
	36.03 Explain the operation and types of the following heating methods: water, steam, forced air, gas, electrical components and heat pumps and associated electrical components.
	36.04 Identify refrigerants.
	36.05 Identify and replace air filters and maintain drain systems.

36.06 Explain how to troubleshoot, repair and replace control systems.

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.