Florida Department of Education
Curriculum Framework

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

PSAV	
Program Number	I460401
CIP Number	0646041502
Grade Level	30, 31
Standard Length	1050 Hours
Teacher Certification	Refer to the **Program Structure** section.
CTSO	SkillsUSA
SOC Codes (all applicable)	49-9071 - Maintenance and Repair Workers
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml
Basic Skills Level	Mathematics: 9 Language: 9 Reading: 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:

			Teacher Certification		
A	BCV0400	Building Construction Helper	AC HEAT MC @7 7G BLDG CONST @7 7G BLDG MAINT @7 7G CARPENTRY @7 7G DRAFTING @7 7G ELECTRICAL @7 7G ENG 7G TEC CONSTR @7 7G TEC DRAFT 7G TROWEL TR 7G PLUMBIN @7 7G SHEETMETAL @7 7G WOODWORKIN @4	450 Hours	49-9071
B	BCV0401	Building Construction Technician 1		300 Hours	49-9071
	BCV0402	Building Construction Technician 2		450 Hours	49-9071

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.

2. Apply appropriate academic and technical skills.

3. Attend to personal health and financial well-being.

4. Communicate clearly, effectively and with reason.

5. Consider the environmental, social and economic impacts of decisions.

6. Demonstrate creativity and innovation.

7. Employ valid and reliable research strategies.

8. Utilize critical thinking to make sense of problems and persevere in solving them.

9. Model integrity, ethical leadership and effective management.

10. Plan education and career path aligned to personal goals.

11. Use technology to enhance productivity.

12. Work productively in teams while using cultural/global competence.

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 Demonstrate carpentry skills.
07.0 Read and interpret construction drawings.
08.0 Frame floor systems based on drawing and specification requirements.
09.0 Frame walls and ceilings based on drawing and specification requirements.
10.0 Frame a roof based on drawing and specification requirements.
11.0 Analyze construction components, materials, hardware and characteristics.
12.0 Demonstrate masonry skills.
13.0 Erect, plumb and brace a simple concrete form with reinforcement.
14.0 Place concrete.
15.0 Lay masonry units.
16.0 Demonstrate science knowledge and skills.
17.0 Understand construction documents, contract documents and specifications.
18.0 Select the appropriate heavy equipment for a given task. (Optional)
19.0 Identify local, state and federal codes and regulations.
20.0 Perform site preparation and maintenance.
21.0 Estimate project costs and schedule construction activities for a specific job.
22.0 Explain all that the built environment encompasses.
23.0 Investigate sustainability issues related to the design, construction and maintenance of the built environment.
24.0 Complete a construction project using skills learned in the program.
25.0 Install roofing materials.
26.0 Install exterior finishes.
27.0 Explain the importance of employability and entrepreneurship skills.
28.0 Demonstrate interior carpentry skill.
29.0 Install cabinets.
30.0 Prepare and apply finishes to surfaces.
31.0 Build stairs.
32.0 Troubleshoot, repair and install plumbing systems.
33.0 Demonstrate knowledge of drain, waste and vent (DWV) systems.
34.0 Measure, cut and join plastic piping.
35.0 Properly measure, ream, cut and join copper piping.
36.0 Troubleshoot, repair and install electrical systems.
37.0 Demonstrate electrical safety.
38.0 Demonstrate a basic understanding of the heating, ventilation and air-conditioning (HVAC) profession.

39.0 Maintain, repair and install heating, ventilation and air-conditioning (HVAC) systems.

2017 – 2018

Florida Department of Education
Student Performance Standards

Program Title: **Building Construction Technologies**
PSAV Number: **I460401**

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	Describe "Right-to-Know" Law as recorded in (29 CFR-1910.1200)
01.04	Identify and use safety equipment and personal protective equipment (PPE).
01.05	Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments.
01.06	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	Describe the development of construction technology, its impact on the built environment and the impact of growth on the construction industry.
02.02	Describe the benefits of the construction industry on health and safety, communication, transportation and the economy.
02.03	Demonstrate an understanding of the relationship between construction and the environment.
02.04	Describe the role of trade unions in the construction industry.
02.05	Demonstrate an understanding of apprenticeship.
02.06	Identify the different classifications of construction projects.
02.07	Define the roles and responsibilities of the general contractor, specialty contractor, construction management and design build firms.
02.08	Identify construction trade occupations and the roles and responsibilities of each craft.
02.09	Identify construction management occupations and the roles and responsibilities of each.
02.10	Identify design and engineering occupations and the roles and responsibilities of each.
02.11	Demonstrate an understanding of the relationship between construction and the economy.
02.12	Describe the process of applying for building permits and variances.
02.13	Demonstrate an understanding 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	Identify and use various types of drill bits.
	03.05	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, 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 miter saws, drill presses, grinders, electric routers and pneumatic nailers.
	04.02	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, 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	Demonstrate carpentry skills--The student will be able to:	
	06.01	Construct various types of concrete forms.
	06.02	Describe in-beds used in concrete formwork.
	06.03	Identify appropriate form stripping and handling techniques.
	06.04	Lay out and install framing members for a structure.
	06.05	Demonstrate the ability to dry in a structure.
07.0	Read and interpret construction drawings--The student will be able to:	
	07.01	Identify basic construction drawing terms, components and symbols.
	07.02	Locate sections, elevations and details to their location on the plan view.
	07.03	Use drawing dimensions to lay out a construction project,
	07.04	Interpret and use architectural scales.
08.0	Frame floor systems based on drawing and specification requirements--The student will be able to:	
	08.01	Identify floor and sill framing and support members.
	08.02	Name the methods used to fasten sills to the foundation.
	08.03	Understand how girder/beam and joist sizes are selected.
	08.04	List and recognize different types of floor joists.
	08.05	List and recognize different types of bridging.
	08.06	List and recognize different types of flooring materials.
	08.07	Explain the purposes of subflooring and underlayment.
	08.08	Match selected fasteners used in floor framing to their correct uses.

	08.09	Estimate the amount of material needed to frame a floor assembly.
	08.10	Demonstrate the ability to:
		a. Lay out and construct a floor assembly
		b. Install bridging (wood cross bridging, solid wood bridging and steel cross bridging).
		c. Install joists for a cantilever floor.
		d. Install a subfloor using butt-joint plywood/OSB panels and structural particle board.
		e. Install a single floor system using tongue-and-groove plywood/OSB panels.
09.0	Frame walls and ceilings based on drawing and specification requirements--The student will be able to:	
	09.01	Identify the components of a wall and ceiling layout.
	09.02	Describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window openings, partitions, bracing and the use of fire stops where applicable.
	09.03	Describe the correct procedure for assembling and erecting an exterior wall.
	09.04	Identify the common materials and methods used for installing sheathing on walls.
	09.05	Lay out, assemble, erect and brace exterior walls for a frame building.
	09.06	Describe wall framing techniques used in masonry construction.
	09.07	Explain the use of metal studs in wall framing.
	09.08	Describe the correct procedure for laying out ceiling joists.
	09.09	Cut and install ceiling joists on a wood frame building.
	09.10	Estimate the materials required to frame walls and ceilings.
10.0	Frame a roof based on drawing and specification requirements--The student will be able to:	
	10.01	Understand the terms associated with roof framing.
	10.02	Identify the roof framing members used in gable and hip roofs.
	10.03	Identify the methods used to calculate the length of a rafter.
	10.04	Identify the various types of trusses used in roof framing.
	10.05	Use a rafter framing square, speed square and calculator in laying out a roof.
	10.06	Identify various types of sheathing used in roof construction.
	10.07	Frame a gable roof with vent openings.
	10.08	Frame a roof opening.
	10.09	Erect a gable roof using trusses.
	10.10	Estimate the materials used in framing and sheathing a roof.
11.0	Analyze construction components, materials, hardware and characteristics--The student will be able to:	
	11.01	Identify the components of various kinds of structures including slabs and foundations, interior and exterior walls, roofs and flooring systems.
	11.02	Identify the types of wall sections.
	11.03	Identify the types and installation procedures of roof, wall and floor sheathing.
	11.04	Identify various roof supports.
12.0	Demonstrate masonry skills--The student will be able to:	
	12.01	Select the tools and equipment used for mixing mortar.
	12.02	Describe the factors that affect the consistency of mortar.
	12.03	Identify the common ratios (M, N, S and O) of mortar mixtures.

12.04	Identify pointing tools and strike mortar joints.
12.05	Repoint old work.
12.06	Prepare a work area, protecting adjacent areas.
12.07	Apply mortar.
12.08	Identify the methods of putting up the line.
12.09	Identify the types of trowels.
12.10	Identify various types of caulking and application.
12.11	Describe procedures for stucco application and repair.
12.12	Mix various types of stucco.
12.13	Understand the various types of concrete, considering application and Pounds per Square Inch (PSI) strength.
12.14	Identify and select concrete tools.
12.15	Demonstrate procedures for concrete repair and installation.
12.16	Identify and select cleaning materials and equipment.
12.17	Demonstrate safe and proper procedures for cleaning equipment, materials, work areas and worker.
12.18	Identify, select, use and maintain tools, materials and equipment used in masonry.
12.19	Use safe and proper procedures for cleaning equipment, materials, work areas and worker.
13.0	Erect, plumb and brace a simple concrete form with reinforcement--The student will be able to:
13.01	Identify the properties of cement.
13.02	Describe the composition of concrete.
13.03	Perform volume estimates for concrete quantity requirements.
13.04	Identify types of concrete reinforcement materials and describe their uses.
13.05	Identify various types of footings and explain their uses.
13.06	Identify the parts of various types of forms.
13.07	Explain the safety procedures associated with the construction and use of concrete forms.
14.0	Place concrete--The student will be able to:
14.01	Slump test concrete before placement.
14.02	Identify equipment used to transport and place concrete.
14.03	Describe the factors that contribute to the quality of concrete placement.
14.04	Demonstrate the correct methods for placing and consolidating concrete into forms.
14.05	Demonstrate how to use a screed to strike off and level concrete to the proper grade in a form.
14.06	Demonstrate how to use tools for placing, floating and finishing concrete.
14.07	Determine when conditions permit the concrete finishing operation to start.
14.08	Name the factors that affect the curing of concrete and describe the methods used to achieve proper curing.
15.0	Lay masonry units--The student will be able to:
15.01	Describe the most common types of masonry units.
15.02	Describe how to set up and plumb a wall.
15.03	Lay a dry bond.
15.04	Spread and furrow a bed joint and butter masonry units.
15.05	Describe the different types of masonry bonds.
15.06	Cut brick and block accurately.

16.0	Demonstrate science knowledge and skills--The student will be able to:	
	16.01	Explain molecular action as a result of temperature extremes, chemical reaction and moisture content.
	16.02	Discuss the role of creativity in constructing scientific questions, methods and explanations.
	16.03	Formulate scientifically investigable questions, construct investigations, collect and evaluate data and develop scientific recommendations based on findings.
	16.04	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.
	16.05	Explain pressure measurement in terms of PSI and inches of mercury.
	16.06	Explain and demonstrate the use of electrical-system testing devices.
17.0	Understand construction documents, contract documents and specifications--The student will be able to:	
	17.01	Explain the purpose and components of contract documents and specifications.
	17.02	Read, interpret and apply plans, elevations, sections and details.
	17.03	Explain the relationships of the elements of contract documents.
	17.04	Create lists of materials and prepare estimates.
	17.05	Use architectural and engineering scales.
	17.06	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)
	17.07	Compare and analyze traditional drafting with computer-aided drafting (CAD) and building information modeling (BIM) to learn how technology has altered opportunities for innovative responses and results.
	17.08	Investigate the use of technology and other resources to inspire design decisions.
18.0	Select the appropriate heavy equipment for a given task (Optional)--The student will be able to:	
	18.01	Identify different types and uses of heavy equipment.
	18.02	Describe the operations of different types of heavy equipment.
19.0	Identify local, state and federal codes and regulations--The student will be able to:	
	19.01	Identify and locate local, state and federal codes, regulations and standards.
	19.02	Identify local, state and federal regulatory agencies.
20.0	Perform site preparation and maintenance--The student will be able to:	
	20.01	Understand zoning requirements.
	20.02	Determine boundary lines.
	20.03	Determine elevations.
	20.04	Understand the need to add, remove or relocate fill to proper compaction.
	20.05	Lay out and mark building location and elevation.
	20.06	Clean and maintain the site.
21.0	Estimate project costs and schedule construction activities for a specific job--The student will be able to:	
	21.01	Calculate material quantities and purchase cost (including sales tax).
	21.02	Calculate labor costs including work hours, duration and cost of workers.
	21.03	Explain and compute federal, state and local taxes.
	21.04	Schedule various construction activities.
22.0	Explain all that the built environment encompasses--The student will be able to:	

	22.01	Research the development of construction technology, its impact on the built environment and the impact of growth on the construction industry.
	22.02	Describe and give examples of the influences and benefits of the construction industry on health and safety, communication, transportation and the economy.
	22.03	Examine and compare the relationship between the built environment and the natural environment.
	22.04	Compare architectural designs and/or models to understand how technical and utilitarian components impact aesthetic qualities.
	22.05	Analyze changes in architectural styles and construction practices over time relative to various environments.
	22.06	Describe the significance of major architects, engineers or inventors to understand their historical influences.
	22.07	Research innovative historical architectural and/or engineering works and examine the significance of their legacy for the future.
	22.08	Identify transitions in design media, technique and focus to explain how technology has changed design throughout history.
23.0	Investigate sustainability issues related to the design, construction and maintenance of the built environment--The student will be able to:	
	23.01	Describe the impact of the construction industry on the natural environment.
	23.02	Describe the life cycle phases of a building and its impacts on the environment throughout the life of the building.
	23.03	Recommend sustainable alternatives to conventional construction practices.
	23.04	Identify specific practices that can lessen adverse impacts on the environment.
	23.05	Understand holistic green construction.
24.0	Complete a construction project using skills learned in the program—The student will be able to:	
	24.01	Manipulate materials, techniques and processes through practice and perseverance using malleable and/ or rigid materials to create a 3-dimensional representational or abstract model.
	24.02	Use divergent thinking, abstract reasoning and various processes to demonstrate imaginative or innovative solutions for a project.
	24.03	Develop competence and dexterity through practice in the use of processes, tools and techniques.
	24.04	Solve design and construction problems, through convergent and divergent thinking, to gain new perspectives.
	24.05	Apply critical-thinking and problem solving skills used in design to develop solutions for real-life issues.
	24.06	Use critical thinking skills for various contexts to develop, refine and reflect on a design theme.
	24.07	Use and maintain tools and equipment to facilitate design and construction process.
	24.08	Work in a project team to show creative cohesiveness, team building, respectful compromise and time-management skills.
25.0	Install roofing materials--The student will be able to:	
24 25		
	25.01	Identify and explain different types of roofing systems and applications.
	25.02	Install various types of shingles.
	25.03	Install roof gutters and downspouts.
	25.04	Seal pipes and vents on roofs.
	25.05	Identify installation procedures for sheet metal roofs, built-up roofs and roof flashing.
26.0	Install exterior finishes--The student will be able to:	
	26.01	Describe the purpose of wall insulation and flashing.

	26.02 Install common cornices.
	26.03 Demonstrate lap and panel siding estimating methods.
	26.04 Describe the types and applications of various types of siding (e.g. wood, fiber-cement, vinyl, metal, stucco, masonry, etc.).
	26.05 Install siding.
27.0	Explain the importance of employability and entrepreneurship skills--The student will be able to:
	27.01 Identify and demonstrate positive work behaviors needed to be employable.
	27.02 Develop personal career plan that includes goals, objectives and strategies.
	27.03 Examine licensing, certification and industry credentialing requirements.
	27.04 Maintain a career portfolio to document knowledge, skills and experience.
	27.05 Evaluate and compare employment opportunities that match career goals.
	27.06 Identify and exhibit traits for retaining employment.
	27.07 Identify opportunities and research requirements for career advancement.
	27.08 Research the benefits of ongoing professional development.
	27.09 Examine and describe entrepreneurship opportunities as a career planning option.
28.0	Demonstrate interior carpentry skill--The student will be able to:
	28.01 Install interior finish materials.
	28.02 Install exterior and interior doors.
29.0	Install cabinets--The student will be able to:
	29.01 Identify the parts of a cabinet.
	29.02 Identify the types of cabinet-door installation.
	29.03 Identify the types of cabinet hardware.
	29.04 Install cabinet hardware.
	29.05 Describe cabinet-installation procedures.
30.0	Prepare and apply finishes to surfaces--The student will be able to:
	30.01 Erect an extension ladder and a scaffold.
	30.02 Prepare the surfaces.
	30.03 Apply finished coatings to surfaces with a roller, brush and sprayer.
31.0	Build stairs--The student will be able to:
	31.01 Identify various types and parts of stairs.
	31.02 Identify materials used in the construction of stairs.
	31.03 Interpret construction drawings of stairs.
	31.04 Calculate the total rise, the number and size of the risers and treads required for a stairway.
	31.05 Lay out and cut stringers, risers and treads.
	[redacted]
32.0	Troubleshoot, repair and install plumbing systems--The student will be able to:
	32.01 Troubleshoot, repair and install bathroom fixtures and hardware such as lavatories, water closets, urinals, showers, bathtubs, traps and drain, waste and vent (DWV) systems.

	32.02	Troubleshoot, repair and install kitchen fixtures and hardware, such as sinks, garbage disposals, faucets and hot-water-heater tanks.
	32.03	Identify and install various pipes and tubing used in the plumbing trade.
	32.04	Test and inspect plumbing systems.
33.0	Demonstrate knowledge of drain, waste and vent (DWV) systems-- The student will be able to:	
	33.01	Explain how waste moves from a fixture through the drain system to the environment.
	33.02	Identify the major components of a drainage system and describe their functions.
	33.03	Identify the different types of traps and their components, explain the importance of traps and identify the ways that traps can lose their seals.
	33.04	Identify the various types of drain, waste and vent (DWV) fittings and describe their applications.
	33.05	Identify significant code and health issues, violations and consequences related to DWV systems.
34.0	Measure, cut and join plastic piping--The student will be able to:	
	34.01	Identify types of materials and schedules of plastic piping.
	34.02	Identify proper and improper applications of plastic piping.
	34.03	Identify types of fittings and valves used with plastic piping.
	34.04	Identify and determine the kinds of hangers and supports needed for plastic piping.
	34.05	Identify the various techniques used in hanging and supporting plastic piping.
	34.06	Explain proper procedures for the handling, storage and protection of plastic pipes.
35.0	Properly measure, ream, cut and join copper piping--The student will be able to:	
	35.01	Identify the types of materials and schedules used with copper piping.
	35.02	Identify the material properties, storage and handling requirements of copper piping.
	35.03	Identify the types of fittings and valves used with copper piping.
	35.04	Identify the techniques used in hanging and supporting copper piping.
	35.05	Identify the hazards and safety precautions associated with copper piping.
36.0	Troubleshoot, repair and install electrical systems--The student will be able to:	
	36.01	Explain basic electrical theory.
	36.02	Explain branch circuit systems.
	36.03	Calculate and select service-entrance equipment.
	36.04	Identify and explain Ground Fault Circuit Interrupter (GFCI) circuitry.
	36.05	Troubleshoot electrical systems, using testing and metering devices.
	36.06	Install electrical outlets, switches and light fixtures.
	36.07	Install and replace breakers and fuses.
	36.08	Identify types of wiring raceways.
	36.09	Wire a blower motor into an electrical supply.
	36.10	Test and inspect electrical systems.
	36.11	Explain basic motor-control operation.
	36.12	Describe rules for installing electric space heating and HVAC requirements.
37.0	Demonstrate electrical safety--The student will be able to:	
	37.01	Identify electrical hazards and how to avoid or minimize them in the workplace.

	37.02	Explain safety issues concerning lockout/tag-out procedures, confined space entry, respiratory protection and fall protection systems.
	37.03	Develop a task plan and hazard assessment for a given task and select the appropriate personal protective equipment (PPE) and work methods.
	37.04	Explain the Role of the National Electric Code and describe how to determine electric service requirements.
38.0	Demonstrate a basic understanding of the heating, ventilation and air-conditioning (HVAC) profession--The student will be able to:	
	38.01	Identify careers in the HVAC industry and the educational pathways (including apprenticeships) available.
	38.02	Explain what the ‘Clean Air Act’ means to the HVAC profession.
	38.03	Describe regulatory codes relevant to the HVAC industry.
	38.04	Read and interpret HVAC plans and schedules.
39.0	Maintain, repair and install heating, ventilation and air-conditioning (HVAC) systems--The student will be able to:	
	39.01	Explain heating and cooling principles and code requirements.
	39.02	Describe methods of calculating heating and cooling loads.
	39.03	Explain the operation and types of the following heating methods: water, steam, forced air, gas, electrical components and heat pumps.
	39.04	Troubleshoot and repair a circulation pump, zone valves, burners, pilot lights and thermocouples in a heating system.
	39.05	Identify refrigerants.
	39.06	Determine a refrigerant level.
	39.07	Describe the proper procedures for descaling air-conditioner units.
	39.08	Troubleshoot, repair and replace air filters, drive belts and drain systems.
	39.09	Troubleshoot, repair and replace control systems.
	39.10	Explain the computer monitoring system associated with heating, ventilation and air-conditioning (HVAC) control systems and air-quality management.

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.

Special Notes

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student. Access MyCareerShines by visiting: www.mycareershines.org.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for 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.

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 (if applicable)

In PSAV 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: Mathematics 9, Language 9, and Reading 9. 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(7), 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(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.) Exemptions from state, national or industry licensure are limited to the certifications listed on the Basic Skills and Licensure Exemption List which may be accessed from the CTE Program Resources page.

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.

Additional Resources

For additional information regarding articulation agreements, Bright Futures Scholarships, Fine Arts/Practical Arts Credit and Equivalent Mathematics and Equally Rigorous Science Courses please refer to:
http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml