

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title: Building Construction Technology
Program Type: Job Preparatory
Occupational Area: Industrial Education
Components: Two Occupational Completion Points

	<u>Secondary</u>	<u>PSAV</u>
Program Numbers	8720300	I460401
CIP Number	0646.040102	0646.040102
Grade Level	9-12, 30, 31	30, 31
SOC	49-9042	49-9042
Facility Code	203	203
CTSO	SkillsUSA	SkillsUSA
Co-op Method	Yes	Yes
Apprenticeship	Yes	Yes

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

This program focuses on broad, transferable skills, stresses the understanding of all aspects of the building construction industry, and demonstrates such elements of the industry as planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues, and health, safety, and environmental issues.

- II. **PROGRAM STRUCTURE:** This program is a planned sequence of instruction consisting of two occupational completion points. The recommended sequence allows students to complete specified portions of the program for employment or to remain for advanced training. A student who completes the applicable competencies at the first occupational completion point may either continue with the training program or terminate as an occupational completer.

The following diagram illustrates the program

BUILDING CONSTRUCTION TECHNOLOGY

OCP B

BUILDING CONSTRUCTION
TECHNICIAN
INDUSTRY TITLE

BUILDING CONSTRUCTION TECHNOLOGY 4-7

(4 Credits/600 Hours)

OCP A

BUILDING CONSTRUCTION I
INDUSTRY
TITLE

BUILDING CONSTRUCTION TECHNOLOGY 1-3

(3 Credits/450 Hours)

At the secondary level, the Building Construction Technology program consists of the following courses:

BUILDING CONSTRUCTION TECHNOLOGY COURSES - 3 secondary credits

8720310 - Building Construction Technology 1 (150)
8720320 - Building Construction Technology 2 (150)
8720330 - Building Construction Technology 3 (150) [450] OCP A

BUILDING CONSTRUCTION TECHNOLOGY COURSES - 4 secondary credits

8720340 - Building Construction Technology 4 (150)
8720350 - Building Construction Technology 5 (150)
8720360 - Building Construction Technology 6 (150)
8720370 - Building Construction Technology 7 (150) [600] OCP B

III. **LABORATORY ACTIVITIES**: Classroom, shop, and laboratory activities are an integral part of this program. These activities include instruction in the use of the safety procedures, tools, equipment, materials, and processes found in the industry. Equipment and supplies should be provided to enhance hands-on experiences for students in the chosen occupation.

IV. **SPECIAL NOTE**: SkillsUSA, Inc. is the appropriate Career and Technical Student Organization (CTSO) for providing leadership training and for reinforcing specific career and technical skills. Career and Technical Student Organizations, when provided, shall be an integral part of the career and technical instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, FAC.

This program may be offered in postsecondary adult vocational (PSAV) courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643, F.S.

Cooperative training - OJT is appropriate for this program. Whenever cooperative training - OJT is offered, the following are required for each student: a training plan, signed by the student, teacher, and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a workstation that reflects equipment, skills and tasks that are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Rule 6A-10.040, FAC, the minimum basic-skills grade levels required for adult vocational students to complete this program are: Mathematics 9.0, Language 9.0, Reading 9.0. These grade-level numbers correspond to grade-equivalent scores obtained on one of the state-designated basic-skills examinations. If a student does not meet the basic-skills level required for completion of the program, remediation should be provided concurrently through Vocational Preparatory Instruction (VPI). Please refer to the Rule for exemptions.

SCANS Competencies: Instructional strategies for this program must include methods that require students to identify, organize, and use resources appropriately; to work with each other cooperatively and productively; to acquire and use information; to understand social, organizational, and technological systems; and to work with a variety of tools and equipment. Instructional strategies must also incorporate the methods to improve students' personal qualities and high-order thinking skills.

When a secondary student with a disability is enrolled in a vocational class with modifications to the curriculum framework, the particular outcomes and student performance standards, which the student must master to earn credit, must be specified on an individual basis. The job or jobs for which the student is being trained should be reflected in the student's desired postschool outcome statement on the Transition Individual Educational Plan (Transition IEP).

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Adult students with disabilities must self-identify and request such services. 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.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not

preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3) (b) F.S.

The standard length of this program is 1050 hours.

Florida Department of Education
INTENDED OUTCOMES

Program Title: Building Construction Technology

	<u>Secondary</u>	<u>PSAV</u>
Program Numbers	8720300	I460401
CIP Number	0646.040102	0646.040102
Grade Level	9-12, 30, 31	30, 31
Length	7 Credits	1,050 Hours
Certification	BLDG MAINT @7 G BLDG CONST @7 G TROWEL TR @7 G PLUMBING @7 G ELECTRICAL @7 G AC HEAT MC @7 G TEC CONSTR @7 G CARPENTRY @7 G DRAFTING @7 G SHEETMETAL @7 G TEC DRAFT @7 G	BLDG MAINT @7 G BLDG CONST @7 G TROWEL TR @7 G PLUMBING @7 G ELECTRICAL @7 G AC HEAT MC @7 G TEC CONSTR @7 G CARPENTRY @7 G DRAFTING @7 G SHEETMETAL @7 G TEC DRAFT @7 G
Basic Skills		
Math		9
Language		9
Reading		9

INTENDED OUTCOMES: After successfully completing the appropriate course(s) for each occupational completion point of this program, the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE - A (450 HOURS)

BUILDING CONSTRUCTION HELPER - INDUSTRY TITLE (SOC 49-9042)

- 01.0 Follow safety practices and disaster plans.
- 02.0 Demonstrate an understanding of the construction industry and related occupations.
- 03.0 Identify and use basic hand tools.
- 04.0 Identify power tools and describe their proper operation.
- 05.0 Identify construction components, materials, hardware, and characteristics.
- 06.0 Demonstrate masonry skills.
- 07.0 Apply appropriate communication and computer skills.
- 08.0 Demonstrate an understanding of the appropriate basic science.
- 09.0 Demonstrate employability skills.
- 10.0 Demonstrate positive human relations and leadership skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE - B (600 HOURS)

CONSTRUCTION TECHNICIAN, BUILDING - (SOC 49-9042)

- 11.0 Identify local, state, and federal codes and regulations.
- 12.0 Apply appropriate math skills.
- 13.0 Read blueprints, contract documents and specifications.
- 14.0 Describe the operations of heavy equipment and demonstrate the use of power tools.
- 15.0 Demonstrate carpentry skills.
- 16.0 Install cabinets.
- 17.0 Prepare and apply finishes to surfaces.
- 18.0 Install roofing materials.
- 19.0 Troubleshoot, repair, and install plumbing systems.
- 20.0 Troubleshoot, repair, and install electrical systems.
- 21.0 Maintain, repair, and install heating, ventilation, and air-cooling (HVAC) systems.
- 22.0 Perform site preparation and maintenance.
- 23.0 Demonstrate an understanding of entrepreneurship.

**Florida Department of Education
STUDENT PERFORMANCE STANDARDS**

Program Title: Building Construction Technology
 Secondary Number: 8720300
 Postsecondary Number: I460401

OCCUPATIONAL COMPLETION POINT - DATA CODE - A

BUILDING CONSTRUCTION HELPER - INDUSTRY TITLE

- 01.0 FOLLOW SAFETY PRACTICES AND DISASTER PLANS--The student will be able to:
- 01.01 Comply with all applicable Occupational Safety and Health Administration (OSHA) rules and regulations.
 - 01.02 Identify and locate the 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.
 - 01.05 Identify and follow disaster plans.
- 02.0 DEMONSTRATE AN UNDERSTANDING OF THE CONSTRUCTION INDUSTRY AND 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 IDENTIFY AND USE BASIC HAND TOOLS--The student will be able to:
- 03.01 Use a claw hammer to drive and pull out nails.

- 03.02 Use handsaws to cut boards.
- 03.03 Use screwdrivers to drive in screws.
- 03.04 Drill holes with hand-powered drills.
- 03.05 Identify and use various types of:
 - a. Wrenches
 - b. Pipe wrenches and plumbing tools
 - c. Chisels
 - d. Staple guns
 - e. Wood planes
 - f. Woodworking files
 - g. Spirit levels
 - h. Socket wrench sets
 - i. Hand or block sanders
 - j. Carpenters' squares

- 04.0 IDENTIFY POWER TOOLS AND DESCRIBE THEIR PROPER OPERATION--The student will be able to:
 - 04.01 Identify power tools, including:
 - a. Sanders
 - b. Drills
 - c. Screwdrivers
 - d. Hand-held saws
 - e. Reciprocating saws
 - f. Radial-arm saws
 - g. Table saws
 - h. Drill presses
 - i. Band saws
 - j. Miter saws
 - k. Planes
 - l. Electric routers
 - 04.02 Describe the proper operation of power tools and equipment.

- 05.0 IDENTIFY CONSTRUCTION COMPONENTS, MATERIALS, HARDWARE, AND CHARACTERISTICS--The student will be able to:
 - 05.01 Identify the components of various kinds of structures, including:
 - a. Slabs and foundations
 - b. Interior walls
 - c. Exterior walls
 - d. Roofs
 - e. Flooring systems
 - 05.02 Identify the types of wall intersections.
 - 05.03 Identify the types and installation procedures of:
 - a. Roof sheathing
 - b. Wall sheathing
 - c. Floor sheathing
 - 05.04 Identify various roof supports.

- 06.0 DEMONSTRATE MASONRY SKILLS--The student will be able to:
 - 06.01 Identify the tools and equipment used for mixing mortar.
 - 06.02 Identify the factors that affect the consistency of mortar.
 - 06.03 Identify the common ratios (M, N, S, and O) of mortar mixtures.
 - 06.04 Identify pointing tools and strike mortar joints.

- 06.05 Repoint old work.
 - 06.06 Prepare a work area, protecting adjacent areas.
 - 06.07 Apply mortar.
 - 06.08 Identify the methods of putting up the line.
 - 06.09 Identify the types of trowels.
 - 06.10 Identify various types of caulking and application.
 - 06.11 Describe procedures for stucco application and repair.
 - 06.12 Mix various types of stucco.
 - 06.13 Mix various types of concrete, considering application and pounds per square inch (PSI) strength.
 - 06.14 Identify and select concrete tools.
 - 06.15 Describe the procedures for concrete repair and installation.
 - 06.16 Identify and select cleaning materials and equipment.
 - 06.17 Demonstrate safe and proper procedures for cleaning equipment, materials, work area, and worker.
- 07.0 APPLY APPROPRIATE COMMUNICATION AND COMPUTER SKILLS--The student will be able to:
- 07.01 Ask and answer questions coherently and concisely.
 - 07.02 Read and follow written instructions and listen to and follow oral instructions.
 - 07.03 Make oral presentations.
 - 07.04 Write reports using word-processing software.
 - 07.05 Read and interpret industry-related materials.
 - 07.06 Find information in technical literature such as manufacturer's manuals.
 - 07.07 Read and interpret the graphs, charts, diagrams, and tables commonly used in the industry.
 - 07.08 Complete the forms and invoices commonly used in the industry.
 - 07.09 Demonstrate appropriate telephone communication skills.
 - 07.10 Use trade-related computer software.
- 08.0 DEMONSTRATE AN UNDERSTANDING OF THE APPROPRIATE BASIC SCIENCE--The student will be able to:
- 08.01 Explain molecular action as a result of temperature extremes, chemical reaction, and moisture content.
 - 08.02 Draw conclusions or make inferences from data.
 - 08.03 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.
 - 08.04 Explain pressure measurement in terms of PSI and inches of mercury.
 - 08.05 Explain the use of electrical-system testing devices.
- 09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:
- 09.01 Conduct a job search and identify advanced-training opportunities.
 - 09.02 Secure information about a job.
 - 09.03 Identify the documents, including a resume, which may be required for a job application.
 - 09.04 Complete a job-application form.

- 09.05 Demonstrate competence in job-interview techniques.
- 09.06 Demonstrate productive work habits and positive attitudes.
- 09.07 Demonstrate knowledge of how to make job changes appropriately.
- 09.08 Demonstrate ethical practices and responsibilities.
- 09.09 Demonstrate acceptable personal hygiene and a professional appearance.
- 09.10 Apply the principles of time management, work simplification, and teamwork when performing assigned tasks.
- 09.11 Explain the importance of taking pride in the quality of work performed.
- 09.12 Describe the importance of drug-free workplace and industry policies toward drug use.
- 09.13 Describe the ramifications of a poor-driving record on employability opportunities.
- 09.14 Explain the importance of confidentiality in the workplace.

10.0 DEMONSTRATE POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

- 10.01 Exercise self-control.
- 10.02 Identify and demonstrate appropriate responses to criticism.
- 10.03 Explain the importance of interpersonal skills to success in the industry.
- 10.04 Demonstrate respect for person and property.
- 10.05 Perform roles in a student run simulated business personnel system and SkillsUSA-VICA (SkillsUSA-VICA is optional).
- 10.06 Exemplify an understanding of the dignity and worth of craftsmanship.

OCCUPATIONAL COMPLETION POINT - DATA CODE - B
CONSTRUCTION TECHNICIAN, BUILDING - (SOC 49-9042)

11.0 IDENTIFY LOCAL, STATE, AND FEDERAL CODES AND REGULATIONS--The student will be able to:

- 11.01 Identify and locate local, state, and federal codes, regulations, and standards.
- 11.02 Identify local, state, and federal regulatory agencies.

12.0 APPLY APPROPRIATE MATH SKILLS--The student will be able to:

- 12.01 Solve job-related problems by adding, subtracting, multiplying, and dividing numbers, using fractions, decimals, and whole numbers.
- 12.02 Change numbers to percents.
- 12.03 Solve job-related problems, using a calculator.
- 12.04 Read a ruler and a tape measure.
- 12.05 Compute feet, inches, and yards.
- 12.06 Change hours and minutes to decimals, fractions, and mixed numbers.
- 12.07 Solve job-related problems, using handbooks, charts, and tables.
- 12.08 Determine ratios and proportions.

- 12.09 Convert measurements from the English to the metric system and from the metric to the English system.
 - 12.10 Solve problems for volume, weight, area, circumference, and perimeter measurements for rectangles, squares, and cylinders.
 - 12.11 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet, and inches.
 - 12.12 Determine the purchase price of materials, including sales tax.
 - 12.13 Calculate the following for a specific job:
 - a. Work hours
 - b. Cost of the workers
 - c. Cost to be charged to the client
 - 12.14 Explain and compute federal, state, and local taxes.
 - 12.15 Calculate the time charged for labor on the job.
- 13.0 READ CONTRACT BLUEPRINTS, DOCUMENTS AND SPECIFICATIONS--The student will be able to:
- 13.01 Explain the purpose and components of contract documents and specifications.
 - 13.02 Identify and explain the following elements:
 - a. Dimensions
 - b. Construction views
 - c. Section views
 - d. Site plans
 - e. Foundation plans
 - f. Floor plans and elevations
 - g. Details
 - h. Wiring details
 - 13.03 Explain the relationships of the elements of contract documents.
 - 13.04 Identify building symbols.
 - 13.05 Identify lists of materials and specifications.
 - 13.06 Use architectural and engineering scales.
 - 13.07 Demonstrate a basic understanding of computer-aided design.
 - 13.08 Prepare estimates using estimating software.
 - 13.09 Prepare schedules using bar charts and scheduling software.
- 14.0 DESCRIBE THE OPERATIONS OF HEAVY EQUIPMENT AND DEMONSTRATE THE USE OF POWER TOOLS--The student will be able to:
- 14.01 Identify different types and uses of heavy equipment.
 - 14.02 Describe the operations of different types of heavy equipment.
 - 14.03 Set up, maintain, and demonstrate the use of power tools.
- 15.0 DEMONSTRATE CARPENTRY SKILLS--The student will be able to:
- 15.01 Construct various types of concrete forms.
 - 15.02 Describe in-beds used in concrete formwork.
 - 15.03 Identify appropriate form stripping and handling techniques.
 - 15.04 Layout and install framing members for a structure.
 - 15.05 Demonstrate the ability to dry in a structure.
 - 15.06 Install interior finish materials.
 - 15.07 Install exterior and interior doors.

- 15.08 Install windows.
- 15.09 Install interior trim.
- 15.10 Measure the size of a room.
- 15.11 Install acoustical ceiling systems.
- 15.12 Identify the types of insulation.
- 16.0 INSTALL CABINETS--The student will be able to:
 - 16.01 Identify the parts of a cabinet.
 - 16.02 Identify the types of cabinet-door installation.
 - 16.03 Identify the types of cabinet hardware.
 - 16.04 Install cabinet hardware.
 - 16.05 Describe cabinet-installation procedures.
- 17.0 PREPARE AND APPLY FINISHES TO SURFACES--The student will be able to:
 - 17.01 Erect an extension ladder and a scaffold.
 - 17.02 Prepare the surfaces.
 - 17.03 Apply finished coatings to surfaces with a roller, brush, and sprayer.
- 18.0 INSTALL ROOFING MATERIALS--The student will be able to:
 - 18.01 Identify and explain different types of roofing systems and applications.
 - 18.02 Install asphalt shingles.
 - 18.03 Install roof gutters and downspouts.
 - 18.04 Seal pipes and vents on roofs.
 - 18.05 Identify installation procedures for:
 - a. Sheet metal roofs
 - b. Built-up roofs
 - c. Roof flashing
- 19.0 TROUBLESHOOT, REPAIR, AND INSTALL PLUMBING SYSTEMS--The student will be able to:
 - 19.01 Troubleshoot, repair, and install bathroom fixtures and hardware, such as:
 - a. Lavatory
 - b. Water closet
 - c. Urinal
 - d. Shower
 - e. Bathtub
 - f. Traps
 - g. Drain, waste, and vent (DWV) system
 - 19.02 Troubleshoot, repair, and install kitchen fixtures and hardware, such as sinks, garbage disposals, faucets, and hot-water-heater tanks.
 - 19.03 Identify and install various pipes, tubing, fittings and connectors used in the plumbing trade.
 - 19.04 Test and inspect plumbing systems.
- 20.0 TROUBLESHOOT, REPAIR, AND INSTALL ELECTRICAL SYSTEMS--The student will be able to:
 - 20.02 Explain basic electrical theory.

- 20.02 Explain branch circuit systems.
 - 20.03 Identify and explain ground fault circuit interrupter (GFCI) circuitry.
 - 20.04 Troubleshoot electrical systems, using testing and metering devices.
 - 20.05 Install electrical:
 - a. Outlets
 - b. Switches
 - c. Light fixtures
 - 20.06 Install and replace breakers and fuses.
 - 20.07 Identify types of wiring raceways.
 - 20.08 Wire a blower motor into an electrical supply.
 - 20.09 Test and inspect electrical systems.
 - 20.10 Explain basic motor-control operation.
- 21.0 MAINTAIN, REPAIR, AND INSTALL HEATING, VENTILATION, AND AIR-COOLING (HVAC) SYSTEMS--The student will be able to:
- 21.01 Explain heating and cooling principles and code requirements.
 - 21.02 Describe methods of calculating heating and cooling loads.
 - 21.03 Explain the operation and types of the following heating methods: water, steam, forced air, gas, electrical components, and heat pumps.
 - 21.04 Troubleshoot and repair a circulation pump, zone valves, burners, pilot lights, and thermocouples in a heating system.
 - 21.05 Identify refrigerants.
 - 21.06 Determine a refrigerant level.
 - 21.07 Describe the proper procedures for descaling air-conditioner units.
 - 21.08 Troubleshoot, repair, and replace air filters, drive belts, and drain systems.
 - 21.09 Troubleshoot, repair, and replace control systems.
 - 21.10 Explain the computer monitoring system associated with heating, ventilation, and air-conditioning (HVAC) control systems and air-quality management.
- 22.0 PERFORM SITE PREPARATION AND MAINTENANCE--The student will be able to:
- 22.01 Determine zoning requirements.
 - 22.02 Assess suitability for project.
 - 22.03 Determine boundary lines.
 - 22.04 Determine elevations.
 - 22.05 Determine need to add, remove, or relocate fill.
 - 22.06 Layout and mark building location and elevation.
 - 22.07 Clean and maintain the site.
- 23.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:
- 23.01 Define "entrepreneurship."
 - 23.02 Describe the importance of entrepreneurship to the American economy.
 - 23.03 List the advantages and disadvantages of business ownership.

- 23.04 Identify the risks involved in the ownership of a business.
- 23.05 Identify the personal characteristics of a successful entrepreneur.
- 23.06 Identify the business skills needed to operate a small business efficiently and effectively.
- 23.07 Describe the employer's responsibilities to support the business and industry.

**Florida Department of Education
STUDENT PERFORMANCE STANDARDS**

Course Number: 8720310
Course Title: Building Construction Technology 1
Course Credit: 1

COURSE DESCRIPTION:

The purpose of this course is to develop the competencies essential to the building construction industry. These competencies include skills and knowledge related to safety practices, understanding all aspects of the industry and the use of hand and power tools and related construction theory.

01.0 FOLLOW SAFETY PRACTICES AND DISASTER PLANS--The student will be able to:

- 01.01 Comply with all applicable Occupational Safety and Health Administration (OSHA) rules and regulations.
- 01.02 Identify and locate the 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.
- 01.05 Identify and follow disaster plans.

02.0 DEMONSTRATE AN UNDERSTANDING OF THE CONSTRUCTION INDUSTRY AND 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 IDENTIFY AND USE BASIC HAND TOOLS--The student will be able to:

03.01 Use a claw hammer to drive and pull out nails.

03.02 Use handsaws to cut boards.

03.03 Use screwdrivers to drive in screws.

03.04 Drill holes with hand-powered drills.

03.05 Identify and use various types of:

- a. Wrenches
- b. Pipe wrenches and plumbing tools
- c. Chisels
- d. Staple guns
- e. Wood planes
- f. Woodworking files
- g. Spirit levels
- h. Socket wrench sets
- i. Hand or block sanders
- j. Carpenters' squares

04.0 IDENTIFY POWER TOOLS AND DESCRIBE THEIR PROPER OPERATION--The student will be able to:

04.01 Identify power tools, including:

- a. Sanders
- b. Drills
- c. Screwdrivers
- d. Hand-held saws
- e. Reciprocating saws
- f. Radial-arm saws
- g. Table saws
- h. Drill presses
- i. Band saws
- j. Miter saws
- k. Planes
- l. Electric routers

04.02 Describe the proper operation of power tools and equipment.

**Florida Department of Education
STUDENT PERFORMANCE STANDARDS**

Course Number: 8720320
Course Title: Building Construction Technology 2
Course Credit: 1

COURSE DESCRIPTION:

The purpose of this course is to develop the competencies necessary for the building, construction and repair industry. These competencies relate to construction components, materials and hardware, Masonry skills and theory.

05.0 IDENTIFY CONSTRUCTION COMPONENTS, MATERIALS, HARDWARE, AND CHARACTERISTICS--The student will be able to:

- 05.01 Identify the components of various kinds of structures, including:
 - a. Slabs and foundations
 - b. Interior walls
 - c. Exterior walls
 - d. Roofs
 - e. Flooring systems
- 05.02 Identify the types of wall intersections.
- 05.03 Identify the types and installation procedures of:
 - a. Roof sheathing
 - b. Wall sheathing
 - c. Floor sheathing
- 05.04 Identify various roof supports.

06.0 DEMONSTRATE MASONRY SKILLS--The student will be able to:

- 06.01 Identify and select the tools and equipment used for mixing mortar.
- 06.02 Describe the factors that affect the consistency of mortar.
- 06.03 Identify the common ratios (M, N, S, and O) of mortar mixtures.
- 06.04 Identify pointing tools and strike mortar joints.
- 06.05 Repoint old work.
- 06.06 Prepare a work area, protecting adjacent areas.
- 06.07 Apply mortar.
- 06.08 Identify the methods of putting up the line.
- 06.09 Identify the types of trowels.
- 06.10 Identify various types of caulking and application.
- 06.11 Describe procedures for stucco application and repair.
- 06.12 Mix various types of stucco.
- 06.13 Mix various types of concrete, considering application and pounds per square inch (PSI) strength.
- 06.14 Identify and select concrete tools.
- 06.15 Demonstrate procedures for concrete repair and installation.
- 06.16 Identify and select cleaning materials and equipment.
- 06.17 Demonstrate safe and proper procedures for cleaning equipment, materials, work areas, and worker.

**Florida Department of Education
STUDENT PERFORMANCE STANDARDS**

Course Number: 8720330
Course Title: Building Construction Technology 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to provide students with a more in-depth theory and knowledge of building construction and repair. The competencies in this course include communication, computer, basic-science, employability, and human-relations and leadership skills.

07.0 APPLY APPROPRIATE COMMUNICATION AND COMPUTER SKILLS--The student will be able to:

- 07.01 Ask and answer questions coherently and concisely.
- 07.02 Read and follow written instructions and listen to and follow oral instructions.
- 07.03 Make oral presentations.
- 07.04 Write reports using word-processing software.
- 07.05 Read and interpret industry-related materials.
- 07.06 Find information in technical literature such as manufacturer's manuals.
- 07.07 Read and interpret the graphs, charts, diagrams, and tables commonly used in the industry.
- 07.08 Complete the forms and invoices commonly used in the industry.
- 07.09 Demonstrate appropriate telephone communication skills.
- 07.10 Use trade-related computer software.

08.0 DEMONSTRATE AN UNDERSTANDING OF THE APPROPRIATE BASIC SCIENCE--The student will be able to:

- 08.01 Explain molecular action as a result of temperature extremes, chemical reaction, and moisture content.
- 08.02 Draw conclusions or make inferences from data.
- 08.03 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.
- 08.04 Explain pressure measurement in terms of PSI and inches of mercury.
- 08.05 Explain and demonstrate the use of electrical-system testing devices.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 09.01 Conduct a job search and identify advanced-training opportunities.
- 09.02 Secure information about a job.
- 09.03 Identify the documents, including a resume, which may be required for a job application.
- 09.04 Complete a job-application form.
- 09.05 Demonstrate competence in job-interview techniques.

- 09.06 Demonstrate productive work habits and positive attitudes.
 - 09.07 Demonstrate knowledge of how to make job changes appropriately.
 - 09.08 Demonstrate ethical practices and responsibilities.
 - 09.09 Demonstrate acceptable personal hygiene and a professional appearance.
 - 09.10 Apply the principles of time management, work simplification, and teamwork when performing assigned tasks.
 - 09.11 Explain the importance of taking pride in the quality of work performed.
 - 09.12 Describe the importance of drug-free workplace and industry policies toward drug use.
 - 09.13 Describe the ramifications of a poor driving record on employability opportunities.
 - 09.14 Explain the importance of confidentiality in the workplace.
- 10.0 DEMONSTRATE POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:
- 10.01 Exercise self-control.
 - 10.02 Identify and demonstrate appropriate responses to criticism.
 - 10.03 Explain the importance of interpersonal skills to success in the industry.
 - 10.04 Demonstrate respect for person and property.
 - 10.05 Perform roles in a student run simulated business personnel system and SkillsUSA-VICA (SkillsUSA-VICA is optional).
 - 10.06 Exemplify an understanding of the dignity and worth of craftsmanship.

**Florida Department of Education
STUDENT PERFORMANCE STANDARDS**

Course Number: 8720340
Course Title: Building Construction Technology 4
Course Credit: 1

COURSE DESCRIPTION:

The purpose of this course is to develop competencies in identifying codes and regulations, applying math skills, and reading contract documents and specifications.

- 11.0 IDENTIFY LOCAL, STATE, AND FEDERAL CODES AND REGULATIONS--The student will be able to:
- 11.01 Identify and locate local, state, and federal codes, regulations, and standards.
 - 11.02 Identify local, state, and federal regulatory agencies.
- 12.0 APPLY APPROPRIATE MATH SKILLS--The student will be able to:
- 12.01 Solve job-related problems by adding, subtracting, multiplying, and dividing numbers, using fractions, decimals, and whole numbers.
 - 12.02 Change numbers to percents.
 - 12.03 Solve job-related problems, using a calculator.
 - 12.04 Read a ruler and a tape measure.
 - 12.05 Compute feet, inches, and yards.
 - 12.06 Change hours and minutes to decimals, fractions, and mixed numbers.
 - 12.07 Solve job-related problems, using handbooks, charts, and tables.
 - 12.08 Determine ratios and proportions.
 - 12.09 Convert measurements from the English to the metric system and from the metric to the English system.
 - 12.10 Solve problems for volume, weight, area, circumference, and perimeter measurements for rectangles, squares, and cylinders.
 - 12.11 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet, and inches.
 - 12.12 Determine the purchase price of materials, including sales tax.
 - 12.13 Calculate the following for a specific job:
 - a. Work hours
 - b. Cost of the workers
 - c. Cost to be charged to the client
 - 12.14 Explain and compute federal, state, and local taxes.
 - 12.15 Calculate the time charged for labor on the job.
- 13.0 READ CONTRACT BLUEPRINTS, DOCUMENTS AND SPECIFICATIONS--The student will be able to:
- 13.01 Explain the purpose and components of contract documents and specifications.
 - 13.02 Identify and explain the following elements:

- a. Dimensions
 - b. Construction views
 - c. Section views
 - d. Site plans
 - e. Foundation plans
 - f. Floor plans and elevations
 - g. Details
 - h. Wiring details
- 13.03 Explain the relationships of the elements of contract documents.
- 13.04 Identify building symbols.
- 13.05 Identify lists of materials and specifications.
- 13.06 Use architectural and engineering scales.
- 13.07 Demonstrate a basic understanding of computer-aided design.
- 13.08 Prepare estimates using estimating software.
- 13.09 Prepare schedules using bar charts and scheduling software.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8720350
Course Title: Building Construction Technology 5
Course Credit: 1

COURSE DESCRIPTION:

The purpose of this course is to develop knowledge and skills in the use of power tools and heavy equipment and in Carpentry skills and theory.

14.0 DESCRIBE THE OPERATIONS OF HEAVY EQUIPMENT AND DEMONSTRATE THE USE OF POWER TOOLS--The student will be able to:

- 14.01 Identify different types and uses of heavy equipment.
- 14.02 Describe the operations of different types of heavy equipment.
- 14.03 Set up, maintain, and demonstrate the use of power tools.

15.0 DEMONSTRATE CARPENTRY SKILLS--The student will be able to:

- 15.01 Construct various types of concrete forms.
- 15.02 Describe in-beds used in concrete formwork.
- 15.03 Identify appropriate form stripping and handling techniques.
- 15.04 Layout and install framing members for a structure.
- 15.05 Demonstrate the ability to dry in a structure.
- 15.06 Install interior finish materials.
- 15.07 Install exterior and interior doors.
- 15.08 Install windows.
- 15.09 Install interior trim.
- 15.10 Measure the size of a room.
- 15.11 Install acoustical ceiling systems.
- 15.12 Identify the types of insulation.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8720360
Course Title: Building Construction Technology 6
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the theory, construction and installation of cabinets, finishes, roofs, and plumbing systems.

16.0 INSTALL CABINETS--The student will be able to:

- 16.01 Identify the parts of a cabinet.
- 16.02 Identify the types of cabinet-door installation.
- 16.03 Identify the types of cabinet hardware.
- 16.04 Install cabinet hardware.
- 16.05 Describe cabinet-installation procedures.

17.0 PREPARE AND APPLY FINISHES TO SURFACES--The student will be able to:

- 17.01 Erect an extension ladder and a scaffold.
- 17.02 Prepare the surfaces.
- 17.03 Apply finished coatings to surfaces with a roller, brush, and sprayer.

18.0 INSTALL ROOFING MATERIALS--The student will be able to:

- 18.01 Identify and explain different types of roofing systems and applications.
- 18.02 Install asphalt shingles.
- 18.03 Install roof gutters and downspouts.
- 18.04 Seal pipes and vents on roofs.
- 18.05 Identify installation procedures for:
 - a. Sheet metal roofs
 - b. Built-up roofs
 - c. Roof flashing

19.0 TROUBLESHOOT, REPAIR, AND INSTALL PLUMBING SYSTEMS--The student will be able to:

- 19.01 Troubleshoot, repair, and install bathroom fixtures and hardware, such as:
 - a. Lavatory
 - b. Water closet
 - c. Urinal
 - d. Shower
 - e. Bathtub
 - f. Traps
 - g. Drain, waste, and vent (DWV) system
- 19.02 Troubleshoot, repair, and install kitchen fixtures and hardware, such as sinks, garbage disposals, faucets, and hot-water-heater tanks.

- 19.03 Identify and install various pipes and tubing used in the plumbing trade.
- 19.04 Test and inspect plumbing systems.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8720370
Course Title: Building Construction Technology 7
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to provide students with an in-depth knowledge of building construction technology and skills in the installation, repair and replacement of electrical, heating, ventilation, and air-cooling (HVAC) systems; site preparation and maintenance; and entrepreneurship.

20.0 TROUBLESHOOT, REPAIR, AND INSTALL ELECTRICAL SYSTEMS--The student will be able to:

- 20.01 Explain basic electrical theory.
- 20.02 Explain branch circuit systems.
- 20.03 Identify and explain ground fault circuit interrupter (GFCI) circuitry.
- 20.04 Troubleshoot electrical systems, using testing and metering devices.
- 20.05 Install electrical:
 - a. Outlets
 - b. Switches
 - c. Light fixtures
- 20.06 Install and replace breakers and fuses.
- 20.07 Identify types of wiring raceways.
- 20.08 Wire a blower motor into an electrical supply.
- 20.09 Test and inspect electrical systems.
- 20.10 Explain basic motor-control operation.

21.0 MAINTAIN, REPAIR, AND INSTALL HEATING, VENTILATION, AND AIR-COOLING (HVAC) SYSTEMS--The student will be able to:

- 21.01 Explain heating and cooling principles and code requirements.
- 21.02 Describe methods of calculating heating and cooling loads.
- 21.03 Explain the operation and types of the following heating methods: water, steam, forced air, gas, electrical components, and heat pumps.
- 21.04 Troubleshoot and repair a circulation pump, zone valves, burners, pilot lights, and thermocouples in a heating system.
- 21.05 Identify refrigerants.
- 21.06 Determine a refrigerant level.
- 21.07 Describe the proper procedures for descaling air-conditioner units.
- 21.08 Troubleshoot, repair, and replace air filters, drive belts, and drain systems.
- 21.09 Troubleshoot, repair, and replace control systems.

- 21.10 Explain the computer monitoring system associated with heating, ventilation, and air-conditioning (HVAC) control systems and air-quality management.

- 22.0 PERFORM SITE PREPARATION AND MAINTENANCE--The student will be able to:
 - 22.01 Determine zoning requirements.
 - 22.02 Assess suitability for project.
 - 22.03 Determine boundary lines.
 - 22.04 Determine elevations.
 - 22.05 Determine need to add, remove, or relocate fill.
 - 22.06 Layout and mark building location and elevation.
 - 22.07 Clean and maintain the site.

- 23.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:
 - 23.01 Define "entrepreneurship."
 - 23.02 Describe the importance of entrepreneurship to the American economy.
 - 23.03 List the advantages and disadvantages of business ownership.
 - 23.04 Identify the risks involved in the ownership of a business.
 - 23.05 Identify the personal characteristics of a successful entrepreneur.
 - 23.06 Identify the business skills needed to operate a small business efficiently and effectively.
 - 23.07 Describe the employer's responsibilities to support the business and industry.