

**Florida Department of Education  
CURRICULUM FRAMEWORK**

**Program Title:** Commercial and Industrial Insulation  
**Program Type:** Job Preparatory  
**Occupational Area:** Industrial Education  
**Components:** One Occupational Completion Point

	<u>PSAV</u>
<b>Program Numbers</b>	<b>I460407</b>
CIP Number	0646.040700
Grade Level	30, 31
SOC	47-2131
Facility Code	203
CTSO	SkillsUSA
Co-op Method	Yes
Apprenticeship	Yes

- I. **PURPOSE:** The purpose of this program is to prepare students for employment or advanced training in the commercial and industrial insulation industry.

This program focuses on the installation of commercial and industrial insulation. It also focuses on broad, transferable skills, stresses the understanding of all aspects of the commercial and industrial insulation industry, and demonstrates such elements of the industry as 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 with one occupational completion point that allows students to achieve the competencies necessary for employment in the industry.
- III. **LABORATORY ACTIVITIES:** Classroom, shop, and laboratory activities are an integral part of this program. These activities include training in the general maintenance and safe use of all instructional resources. Equipment and supplies should be provided to enhance hands-on experiences for students in the chosen occupation. A generic equipment list for this program is available.
- 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 is 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.

***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.

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.

Florida Department of Education  
CURRICULUM FRAMEWORK

**Program Title:** Commercial and Industrial Insulation

	<u>PSAV</u>
<b>Program Number</b>	<b>I460407</b>
CIP Number	0646040700
Grade Level	30, 31
Length	1200 hours
SOC	47-2131
Certification	TEC CONSTR ¶7 ¶G BLDG CONST ¶7 ¶G INSULAT @7 G
Basic Skills	
Math	9
Language	9
Reading	9

**INTENDED OUTCOMES:** After successfully completing the appropriate course(s) for this program, the student will be able to perform the following:

**OCCUPATIONAL COMPLETION POINT - DATA CODE - A**

INSULATION WORKER - (SOC 47-2131)

- 01.0 Demonstrate knowledge and the use of personal protective equipment (PPE).
- 02.0 Demonstrate state-of-the-art work practices.
- 03.0 Identify safety hazards and ways to protect against them.
- 04.0 Demonstrate appropriate communication skills.
- 05.0 Apply appropriate math skills.
- 06.0 Explain and demonstrate appropriate field safety rules and procedures.
- 07.0 Demonstrate knowledge of the general applications and uses of commercial and industrial insulation.
- 08.0 Apply insulation theory to job needs.
- 09.0 Read and interpret blueprints and specifications.
- 10.0 Estimate and order materials for a job site.
- 11.0 Apply various insulation materials.
- 12.0 Install accessory materials for insulation.
- 13.0 Perform specialized insulation activities.
- 14.0 Demonstrate an understanding of the appropriate basic science.
- 15.0 Demonstrate employability skills.
- 16.0 Demonstrate an understanding of entrepreneurship.

**Florida Department of Education  
STUDENT PERFORMANCE STANDARDS**

**Program Title:** Commercial and Industrial Insulation  
**Secondary Number:**  
**Postsecondary Number:** I460407

**OCCUPATIONAL COMPLETION POINT - DATA CODE - A**

INSULATION WORKER - (SOC 47-2131)

01.0 DEMONSTRATE A KNOWLEDGE AND THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)--The student will be able to:

- 01.01 Evaluate the classes and characteristics of respirator types.
- 01.02 Identify the limitations of respirators.
- 01.03 Determine the proper selection, inspection, donning, use, maintenance, and storage procedures of respirators.
- 01.04 Perform positive- and negative-pressure fit checks.
- 01.05 Describe qualitative- and quantitative-fit testing procedures.
- 01.06 Identify the components of a proper respiratory-protection program.
- 01.07 Select and use personal protective clothing.
- 01.08 Use, handle, and store non-disposable clothing.
- 01.09 Examine work-area entry and exit procedures for personal protection.
- 01.10 Identify the activities that are prohibited for personal protection.
- 01.11 Identify individuals, such as family members, who may be exposed to hazardous materials.
- 01.12 Describe the regulations that relate to personal protective equipment.

02.0 DEMONSTRATE STATE-OF-THE-ART WORK PRACTICES--The student will be able to:

- 02.01 Display proper work practices for abatement activities.
- 02.02 Demonstrate the proper construction and maintenance of barriers and decontamination enclosure systems.
- 02.03 Position warning signs.
- 02.04 Demonstrate the proper lockout of electrical and ventilation systems.
- 02.05 Utilize negative-pressure exhaust-ventilation equipment.
- 02.06 Apply proper cleanup and disposal procedures.
- 02.07 Analyze emergency procedures for an unplanned release of materials.
- 02.08 Transport and dispose of materials safely.
- 02.09 Discuss recommended and prohibited work practices.
- 02.10 Explain new abatement-related techniques and methodologies.
- 02.11 Describe relevant federal, state, and local regulatory requirements, such as those of TSCA Title II, RCRA, EPA, and OSHA.

03.0 IDENTIFY SAFETY HAZARDS AND WAYS TO PROTECT AGAINST THEM--The student will be able to:

- 03.01 Identify and describe the physical characteristics and appearance of hazardous materials used in the insulation industry.
  - 03.02 Identify electrical, fire, and explosion hazards.
  - 03.03 Describe heat stress and its symptoms and prevention's.
  - 03.04 Discuss the possible presence of other contaminants and ways to protect against them.
  - 03.05 Analyze work sites for hazardous conditions that could cause slips, trips, and falls.
  - 03.06 Identify confined spaces where safety hazards may exist.
- 04.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS--The student will be able to:
- 04.01 Write logical and understandable statements or phrases to accurately fill out the forms/invoices commonly used in business and industry.
  - 04.02 Read and understand the graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
  - 04.03 Read and follow written instructions and listen to and follow oral instructions.
  - 04.04 Answer and ask questions coherently and concisely.
  - 04.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
  - 04.06 Demonstrate appropriate telephone communication skills.
- 05.0 APPLY APPROPRIATE MATH SKILLS--The student will be able to:
- 05.01 Add, subtract, multiply, and divide numbers, using fractions, decimals, and whole numbers.
  - 05.02 Solve problems for volume, weight, area, circumference, and perimeter measurements for rectangles, squares, and cylinders.
  - 05.03 Measure tolerances on horizontal and vertical surfaces, using centimeters, feet, and inches.
  - 05.04 Determine the purchase price of items, including the applicable sales tax.
  - 05.05 Compute federal, state, and local taxes.
- 06.0 EXPLAIN AND DEMONSTRATE APPROPRIATE FIELD SAFETY RULES AND PROCEDURES--The student will be able to:
- 06.01 Utilize appropriate personal protective equipment (PPE).
  - 06.02 Apply first-aid procedures.
  - 06.03 Set up warning signs, signals, and barricades.
  - 06.04 Identify, select, and operate tools and equipment safely.
  - 06.05 Erect and use ladders and scaffolding safely.
  - 06.06 Transport and store materials safely and securely.
  - 06.07 Follow Occupational Safety and Health Administration (OSHA) and Mining Safety and Health Act (MSHA) rules and regulations.
  - 06.08 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.
  - 06.09 Describe the proper precautions for handling work-related chemicals and hazardous materials.
  - 06.10 Locate and interpret regulating requirements.

07.0 DEMONSTRATE KNOWLEDGE OF THE GENERAL APPLICATIONS AND USES OF  
COMMERCIAL AND INDUSTRIAL INSULATION--The student will be able to:

- 07.01 Describe the uses of insulation.
- 07.02 Identify insulation-bonding agents such as tapes and cements.
- 07.03 Describe the insulation needs of commercial mechanical systems on buildings, such as heating and air-conditioning units.
- 07.04 Describe the insulation needs of industrial mechanical systems such as boilers, turbines, and heat exchangers.

- 08.0 APPLY INSULATION THEORY TO JOB NEEDS--The student will be able to:
- 08.01 Explain the concept and method of heat transfer.
  - 08.02 Identify factors of insulation.
  - 08.03 Analyze moisture effects on insulation materials.
  - 08.04 Identify the cause of vapor and different types of vapor barriers.
- 09.0 READ AND INTERPRET BLUEPRINTS AND SPECIFICATIONS--The student will be able to:
- 09.01 Read and interpret job specifications.
  - 09.02 Analyze a plot plan.
  - 09.03 Verify a plan view.
  - 09.04 Determine a proper elevation section.
  - 09.05 Read and interpret an isometric drawing.
  - 09.06 Interpret a blueprint based on various scales.
  - 09.07 Identify column lines.
  - 09.08 Define blueprint symbols.
- 10.0 ESTIMATE AND ORDER MATERIALS FOR A JOB SITE--The student will be able to:
- 10.01 Estimate the amount of insulation materials needed for a job site.
  - 10.02 Identify and select accessory materials.
  - 10.03 Order the appropriate insulation and accessory materials for the job site.
  - 10.04 Calculate measurements for insulation.
- 11.0 APPLY VARIOUS INSULATION MATERIALS--The student will be able to:
- 11.01 Describe the uses of:
    - a. Fiberglass
    - b. Mineral wool
    - c. Cellular glass
    - d. Polyurethane (rigid)
    - e. Polystyrene (expanded and extended)
    - f. Cellular foam (flexible)
    - g. Calcium silicate
    - h. Expanded perlite
    - i. Ceramic fibers
    - j. Insulating cements
  - 11.02 Install pipe coverings.
  - 11.03 Install insulation to mechanical systems such as block boilers, tanks, flues, and environmental units.
  - 11.04 Describe and install multi-layer applications.
  - 11.05 Install board and block materials.
  - 11.06 Apply blanket duct wrap.
  - 11.07 Cut materials with appropriate tools and equipment.
- 12.0 INSTALL ACCESSORY MATERIALS FOR INSULATION--The student will be able to:
- 12.01 Apply various adhesives.

- 12.02 Utilize cement bonding.
  - 12.03 Install fasteners and clips.
  - 12.04 Apply reinforcement materials.
  - 12.05 Install mastics for vapor proofing.
  - 12.06 Install protective jackets.
  - 12.07 Describe the functions and uses of weather barriers.
- 13.0 PERFORM SPECIALIZED INSULATION ACTIVITIES--The student will be able to:
- 13.01 Describe the uses of the following:
    - a. Insulated panels
    - b. Cryogenic insulation
    - c. Fire-protection materials
    - d. Acoustical insulation
    - e. Temperature refractory insulation
  - 13.02 Install the following:
    - a. Insulated panels
    - b. Cryogenic insulation
    - c. Fire-protection materials
    - d. Acoustical insulation
    - e. Temperature refractory insulation
  - 13.03 Install removable insulation blankets (pads).
  - 13.04 Apply sprayed, formed, and foam insulation's.
- 14.0 DEMONSTRATE AN UNDERSTANDING OF THE APPROPRIATE BASIC SCIENCE--The student will be able to:
- 14.01 Explain molecular action as a result of temperature extremes, chemical reaction, and moisture content.
  - 14.02 Draw conclusions or make inferences from data.
  - 14.03 Explain pressure measurement in terms of pounds per square inch (PSI) and inches of mercury.
- 15.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:
- 15.01 Conduct a job search.
  - 15.02 Secure information about a job.
  - 15.03 Identify documents that may be required for a job application.
  - 15.04 Complete a job-application form correctly.
  - 15.05 Demonstrate competence in job-interview techniques.
  - 15.06 Identify or demonstrate appropriate responses to criticism from an employer, a supervisor, or other employees.
  - 15.07 Identify acceptable work habits.
  - 15.08 Demonstrate knowledge of how to make job changes appropriately.
  - 15.09 Demonstrate acceptable employee health habits.
  - 15.10 Demonstrate knowledge of "Right-to-Know" Law.
- 16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:
- 16.01 Define "entrepreneurship."
  - 16.02 Describe the importance of entrepreneurship to the American economy.
  - 16.03 List the advantages and disadvantages of business ownership.
  - 16.04 Identify the risks involved in the ownership of a business.
  - 16.05 Identify the necessary personal characteristics of a successful entrepreneur.

- 16.06 Identify the business skills needed to operate a small business efficiently and effectively.
- 16.07 Describe the record-keeping requirements of federal, state, and local governments and for legal and insurance purposes.
- 16.08 Explain the key elements of contract specifications.
- 16.09 Explain insurance and liability issues, such as contractor issues, worker's compensation, third-party liabilities and defenses, and insurance coverage and exclusions.