

2011 – 2012

**Florida Department of Education  
Curriculum Framework**

**Program Title:** Major Appliance and Refrigeration Repair  
**Program Type:** Career Preparatory  
**Career Cluster:** Manufacturing

	Secondary	PSAV
Program Number	8706000	I470106
CIP Number	0647.010601	0647.010601
Grade Level	9-12, 30, 31	30, 31
Standard Length	10 Credits	1500 Hours
Teacher Certification	APPLI REPR @7 G GAS FITTER @7 G	APPLI REPR @7 G GAS FITTER @7 G
CTSO	SkillsUSA	SkillsUSA
SOC Codes (all applicable)	49-9031	49-9031
Facility Code	245 <a href="http://www.fldoe.org/edfacil/sref.asp">http://www.fldoe.org/edfacil/sref.asp</a> (State Requirements for Educational Facilities)	
Targeted Occupation List	<a href="http://www.labormarketinfo.com/wec/TargetOccupationList.htm">http://www.labormarketinfo.com/wec/TargetOccupationList.htm</a>	
Perkins Technical Skill Attainment Inventory	<a href="http://www.fldoe.org/workforce/perkins/perkins_resources.asp">http://www.fldoe.org/workforce/perkins/perkins_resources.asp</a>	
Industry Certifications	<a href="http://www.fldoe.org/workforce/fcpea/default.asp">http://www.fldoe.org/workforce/fcpea/default.asp</a>	
Basic Skills Level	N/A	Mathematics: 9.0 Language: 9.0 Reading: 9.0

### Purpose

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 Manufacturing 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 Manufacturing career cluster. This program offers a broad foundation of knowledge and skills to prepare students for employment in appliance and refrigeration repair support services positions.

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

skills, analyzing, diagnosing and repairing washers, dryers, dishwashers, trash compactors, ranges, refrigerators, freezers, microwave ovens, and window air conditioners.

### Program Structure

This program is a planned sequence of instruction consisting of four OCP's.

When offered at the post secondary level, 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.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	EER0310	Appliance Helper	300	49-9031
B	EER0315	Laundry Technician	300	49-9031
C	EER0317	Kitchen Technician	450	49-9031
D	ACR0046	Refrigeration Technician	450	49-9031

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8706010	Residential Appliance and Refrig. Repair 1	1 credit	49-9031	2
	8706020	Residential Appliance and Refrig. Repair 2	1 credit	49-9031	2
B	8706030	Residential Appliance and Refrig. Repair 3	1 credit	49-9031	2
	8706040	Residential Appliance and Refrig. Repair 4	1 credit	49-9031	2
C	8706050	Residential Appliance and Refrig. Repair 5	1 credit	49-9031	2
	8706060	Residential Appliance and Refrig. Repair 6	1 credit	49-9031	2
	8706070	Major Appliance and Refrig. Repair 7	1 credit	49-9031	2
D	8706080	Major Appliance and Refrig. Repair 8	1 credit	49-9031	2
	8706090	Major Appliance and Refrig. Repair 9	1 credit	49-9031	2
	8706100	Major Appliance and Refrig. Repair 10	1 credit	49-9031	2

### Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

### Special Notes

#### **Career and Technical Student Organization (CTSO)**

SkillsUSA is the appropriate 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. The

activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

### **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 program-specific OJT framework apply.

### **Essential Skills**

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. A complete list of Essential Skills and links to instructional resources in support of these Essential Skills are published on the CTE Essential Skills page of the FL-DOE website

([http://www.fldoe.org/workforce/dwdframe/essential\\_skills.asp](http://www.fldoe.org/workforce/dwdframe/essential_skills.asp)).

### **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 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications

(<http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf>).

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 pursuant to Section 1008.29, F.S.; 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.)

### **Accommodations**

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan 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 postsecondary service provider. 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.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

### **Articulation**

The PSAV component of this program has no statewide articulation agreement approved by the Articulation Coordinating Committee. However, this does not preclude the awarding of credits by any college through local agreements.

For details on articulation agreements which correlate to programs and industry certifications refer to [http://www.fldoe.org/workforce/dwdframe/artic\\_frame.asp](http://www.fldoe.org/workforce/dwdframe/artic_frame.asp).

### **Bright Futures/Gold Seal Scholarship**

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at [https://www.osfaffelp.org/bfiehs/fnbpcm02\\_CCTMain.aspx](https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx).

### **Fine Arts/Practical Arts Credit**

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to <http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf>.

### **Standards**

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

- 01.0 Apply proper laboratory practices.
- 02.0 Apply electrical fundamentals.

- 03.0 Apply gas fundamentals.
- 04.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
- 05.0 Demonstrate mathematics knowledge and skills.
- 06.0 Demonstrate science knowledge and skills.
- 07.0 Demonstrate personal money-management concepts, procedures, and strategies
- 08.0 Install, troubleshoot and repair electric clothes dryers.
- 09.0 Install, troubleshoot and repair gas clothes dryers.
- 10.0 Install, troubleshoot and repair clothes washers.
- 11.0 Demonstrate language arts knowledge and skills
- 12.0 Solve problems using critical thinking skills, creativity and innovation.
- 13.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
- 14.0 Install, troubleshoot and repair electric ranges.
- 15.0 Install, troubleshoot and repair microwave ovens.
- 16.0 Install, troubleshoot and repair gas ranges.
- 17.0 Install, troubleshoot and repair dishwashers.
- 18.0 Use information technology tools
- 19.0 Describe the importance of professional ethics and legal responsibilities.
- 20.0 Utilize fundamentals of refrigeration.
- 21.0 Work with tubing and fittings.
- 22.0 Install, troubleshoot and repair refrigerators, icemakers and freezers.
- 23.0 Install, troubleshoot and repair window air conditioners.
- 24.0 Explain the importance of employability and entrepreneurship skills
- 25.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment
- 26.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives

2011 – 2012

**Florida Department of Education  
Student Performance Standards**

**Program Title: Major Appliance and Refrigeration Repair**  
**PSAV Number: I470106**

**Course Number: EER0310**  
**Occupational Completion Point: A**  
**Appliance Helper – 300 Hours – SOC Code 49-9031**

01.0 Apply Proper Laboratory Practices--The student will be able to:

- 01.01 Use industry accepted safety practices.
- 01.02 Explain appropriate first aid for electrical shock and potential shop accidents.
- 01.03 Perform appropriate record keeping functions.
- 01.04 Explain and demonstrate the proper use and care of hand tools.
- 01.05 Explain and demonstrate the proper use and care of meters and test equipment.
- 01.06 Explain and demonstrate the proper use and care of power tools.

02.0 Apply Electrical Fundamentals--The student will be able to:

- 02.01 Explain electron theory.
- 02.02 Identify circuits from schematics and diagrams using commonly accepted symbols.
- 02.03 Explain Ohm's Law.
- 02.04 Measure resistance.
- 02.05 Measure voltage.
- 02.06 Measure amperage.
- 02.07 Measure wattage.
- 02.08 Explain and construct series circuits.
- 02.09 Explain and construct parallel circuits.
- 02.10 Explain and construct combination circuits.
- 02.11 Explain inductance and magnetism and their relationship to electric motors.
- 02.12 Describe how electric motors function.
- 02.13 Explain the function of capacitors and how to troubleshoot them.
- 02.14 Explain the function of relay and switches and how to troubleshoot them.
- 02.15 Explain the function of capacitors and transformers in major appliances.
- 02.16 Explain the concept and rationale of motor protection.
- 02.17 Describe how a compressor functions.

03.0 Apply Gas Fundamentals--The student will be able to:

- 03.01 Explain common use terms.
- 03.02 Explain different types of gas.
- 03.03 Explain specific gravity.
- 03.04 Diagram and explain basic components of a gas burner.
- 03.05 Explain requirements for burning.
- 03.06 Perform pressure tests on gas systems.

- 04.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. -- The students will be able to:
- 04.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
  - 04.02 Locate, organize and reference written information from various sources. CM 3.0
  - 04.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
  - 04.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
  - 04.05 Apply active listening skills to obtain and clarify information. CM 7.0
  - 04.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
  - 04.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0
- 05.0 Demonstrate mathematics knowledge and skills. -- The students will be able to: AF3.0
- 05.01 Demonstrate knowledge of arithmetic operations. AF3.2
  - 05.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
  - 05.03 Construct charts/tables/graphs using functions and data. AF3.5
- 06.0 Demonstrate science knowledge and skills. -- The students will be able to: AF4.0
- 06.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
  - 06.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3
- 07.0 Demonstrate personal money-management concepts, procedures, and strategies. -- The students will be able to:
- 07.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
  - 07.02 Describe the effect of money management on personal and career goals. FL 3.0
  - 07.03 Develop a personal budget and financial goals. FL3.1
  - 07.04 Complete financial instruments for making deposits and withdrawals. FL3.2
  - 07.05 Maintain financial records. FL3.3
  - 07.06 Read and reconcile financial statements. FL3.4
  - 07.07 Research, compare and contrast investment opportunities.

**Course Number: EER0315**

**Occupational Completion Point: B**

**Laundry Technician –300 Hours – SOC Code 49-9031**

08.0 Install, Troubleshoot, And Repair Electric Clothes Dryer--The student will be able to:

08.01 Install an electric dryer.

- 08.02 Identify components and their function.
- 08.03 Troubleshoot timers and components.
- 08.04 Remove and replace timer or component.
- 08.05 Troubleshoot drive motors and components.
- 08.06 Remove and replace drive motor or component.
- 08.07 Troubleshoot heating elements and components.
- 08.08 Remove and replace element or component.
- 08.09 Remove and replace thermostats.
- 08.10 Troubleshoot thermostats.
- 08.11 Troubleshoot bearings and components.
- 08.12 Remove and replace bearing or component.
- 08.13 Troubleshoot belts and pulleys.
- 08.14 Remove and replace belt or pulley.
- 08.15 Troubleshoot rollers and glides.
- 08.16 Remove and replace roller or glides.
- 08.17 Troubleshoot filters.
- 08.18 Remove and replace filter.
- 08.19 Troubleshoot seals.
- 08.20 Remove and replace seals.
- 08.21 Troubleshoot push-to-start switch.
- 08.22 Remove and replace push-to-start switch.
- 08.23 Troubleshoot door switches.
- 08.24 Remove and replace door switches.
- 08.25 Troubleshoot selector switches.
- 08.26 Remove and replace selector switches.
- 08.27 Remove and replace sensor and electronic control.
- 08.28 Troubleshoot sensor and electronic control.
- 08.29 Perform operational check.
- 08.30 Instruct consumer on use and care.

09.0 Install, Troubleshoot And Repair Gas Clothes Dryers--The student will be able to:

- 09.01 Install a gas dryer.
- 09.02 Identify components and their function.
- 09.03 Read and interpret schematics and diagrams.
- 09.04 Troubleshoot electric ignition components.
- 09.05 Remove and replace electric ignition components.
- 09.06 Troubleshoot timers and electronic controls and components.
- 09.07 Remove and replace timer electronic control or component.
- 09.08 Troubleshoot drive motors.
- 09.09 Remove and replace drive motor.
- 09.10 Troubleshoot gas burner.
- 09.11 Remove and replace gas burner.
- 09.12 Troubleshoot thermostats.
- 09.13 Remove and replace thermostat.
- 09.14 Troubleshoot gas valves.
- 09.15 Remove and replace gas valve.
- 09.16 Troubleshoot thermocouples.
- 09.17 Remove and replace thermocouple.
- 09.18 Troubleshoot flame switch.
- 09.19 Remove and replace flame switch.



- 09.20 Troubleshoot bearing assemblies and components.
- 09.21 Remove and replace bearing or component.
- 09.22 Troubleshoot belts and pulleys.
- 09.23 Remove and replace belt or pulley.
- 09.24 Troubleshoot rollers and glides.
- 09.25 Remove and replace roller or glide.
- 09.26 Troubleshoot seals.
- 09.27 Remove and replace seals.
- 09.28 Troubleshoot door switches.
- 09.29 Remove and replace door switch.
- 09.30 Troubleshoot selector switches.
- 09.31 Remove and replace selector switch.
- 09.32 Troubleshoot motor switches.
- 09.33 Remove and replace motor switch.
- 09.34 Perform operational check.
- 09.35 Instruct consumer on use and care.

10.0 Install, Troubleshoot And Repair Clothes Washers--The student will be able to:

- 10.01 Install a clothes washer.
- 10.02 Identify components and their function.
- 10.03 Read and interpret schematics and diagrams.
- 10.04 Troubleshoot timers and components.
- 10.05 Remove and replace timer or component.
- 10.06 Troubleshoot selector switches.
- 10.07 Remove and replace selector switch.
- 10.08 Troubleshoot water level switches and components.
- 10.09 Remove and replace water level switch or component.
- 10.10 Troubleshoot water inlet valves and components.
- 10.11 Remove and replace water inlet valve or component.
- 10.12 Troubleshoot hoses.
- 10.13 Remove and replace hoses.
- 10.14 Troubleshoot water pumps and components.
- 10.15 Remove and replace water pump or component.
- 10.16 Troubleshoot filters.
- 10.17 Remove and replace filter.
- 10.18 Troubleshoot drive motors and components.
- 10.19 Remove and replace drive motor or component.
- 10.20 Troubleshoot belts and pulleys.
- 10.21 Remove and replace belt or pulley.
- 10.22 Troubleshoot transmissions and components.
- 10.23 Remove and replace transmission or component.
- 10.24 Troubleshoot bearings.
- 10.25 Remove and replace bearings.
- 10.26 Troubleshoot water and oil seals.
- 10.27 Remove and replace water and oil seals.
- 10.28 Troubleshoot clutches.
- 10.29 Remove and replace clutch.
- 10.30 Troubleshoot brakes.
- 10.31 Remove and replace brake.
- 10.32 Troubleshoot lid switches and components.

- 10.33 Remove and replace lid switch or component.
- 10.34 Perform operational check.
- 10.35 Instruct consumer on use and care.
- 11.0 Demonstrate language arts knowledge and skills. -- The students will be able to: AF 2.0
- 11.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
- 11.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
- 11.03 Present information formally and informally for specific purposes and audiences. AF2.9
- 12.0 Solve problems using critical thinking skills, creativity and innovation. -- The students will be able to:
- 12.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
- 12.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
- 12.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
- 12.04 Conduct technical research to gather information necessary for decision-making. PS 4.0
- 13.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. -- The students will be able to:
- 13.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
- 13.02 Explain emergency procedures to follow in response to workplace accidents.
- 13.03 Create a disaster and/or emergency response plan. SHE 2.0

**Course Number: EER0317**

**Occupational Completion Point: C**

**Kitchen Technician – 450 Hours – SOC Code 49-9031**

- 14.0 Install, Troubleshoot, And Repair Electric Ranges--The student will be able to:
- 14.01 Install an electric range.
- 14.02 Describe the operation and application of components.
- 14.03 Read and interpret schematics and diagrams.
- 14.04 Troubleshoot clocks/timers.
- 14.05 Remove and replace clocks/timers.
- 14.06 Troubleshoot surface unit switches and components.
- 14.07 Remove and replace surface switches or components.
- 14.08 Troubleshoot oven thermostats and components.
- 14.09 Remove and replace oven thermostats or components.
- 14.10 Troubleshoot oven selector switches and components.
- 14.11 Remove and replace oven selector switches or components.
- 14.12 Troubleshoot surface units and components.

- 14.13 Remove and replace surface units or components.
- 14.14 Troubleshoot bake and broil elements.
- 14.15 Remove and replace bake and broil elements.
- 14.16 Troubleshoot electronic controls.
- 14.17 Remove and replace electronic controls.
- 14.18 Troubleshoot time delay relays.
- 14.19 Remove and replace time delay relay.
- 14.20 Troubleshoot oven sensors and components.
- 14.21 Remove and replace oven sensor or component.
- 14.22 Troubleshoot door locks and components.
- 14.23 Remove and replace door lock or component.
- 14.24 Troubleshoot fans.
- 14.25 Remove and replace fan.
- 14.26 Troubleshoot gaskets and seals.
- 14.27 Remove and replace gasket or seals.
- 14.28 Perform operational check.
- 14.29 Instruct consumer on use and care.

15.0 Install, Troubleshoot, And Repair Microwave Ovens--The student will be able to:

- 15.01 Install a microwave oven.
- 15.02 Describe the operation and application of components.
- 15.03 Read and interpret schematics and diagrams.
- 15.04 Troubleshoot clocks/timers/electronic controls.
- 15.05 Remove and replace clocks/timers/electronic controls.
- 15.06 Troubleshoot door switches.
- 15.07 Remove and replace door switches.
- 15.08 Troubleshoot relays.
- 15.09 Remove and replace relays.
- 15.10 Troubleshoot thermal protectors.
- 15.11 Remove and replace thermal protectors.
- 15.12 Troubleshoot the power transformer.
- 15.13 Remove and replace the power transformer.
- 15.14 Troubleshoot the high voltage diode.
- 15.15 Remove and replace the high voltage diode.
- 15.16 Troubleshoot the capacitor.
- 15.17 Remove and replace the capacitor.
- 15.18 Troubleshoot the magnetron.
- 15.19 Remove and replace the magnetron.
- 15.20 Troubleshoot the fan.
- 15.21 Remove and replace the fan.
- 15.22 Troubleshoot the stirrer blade and motor.
- 15.23 Remove and replace the stirrer blade and motor.
- 15.24 Troubleshoot the turntable motor.
- 15.25 Remove and replace the turntable motor.
- 15.26 Perform operational check.
- 15.27 Instruct consumer on use and care.

16.0 Install, Troubleshoot, And Repair Gas Ranges--The student will be able to:

- 16.01 Install a gas range.

- 16.02 Identify components and their function.
- 16.03 Read and interpret schematics and diagrams.
- 16.04 Troubleshoot clocks/timers/electronic controls.
- 16.05 Remove and replace clocks/timers/electronic controls.
- 16.06 Troubleshoot oven thermostats.
- 16.07 Remove and replace oven thermostats.
- 16.08 Troubleshoot oven selector switches.
- 16.09 Remove and replace oven selector switches.
- 16.10 Troubleshoot self-clean relays.
- 16.11 Remove and replace self-clean relays.
- 16.12 Troubleshoot oven sensors.
- 16.13 Remove and replace oven sensor.
- 16.14 Troubleshoot door locks.
- 16.15 Remove and replace door lock.
- 16.16 Troubleshoot fans.
- 16.17 Remove and replace fan.
- 16.18 Troubleshoot gas valves for surface burners.
- 16.19 Remove and replace gas valve for surface burner.
- 16.20 Troubleshoot gas valve for oven.
- 16.21 Remove and replace gas valve for oven.
- 16.22 Troubleshoot electric igniters.
- 16.23 Remove and replace electric igniter.
- 16.24 Troubleshoot safety valves.
- 16.25 Remove and replace safety valve.
- 16.26 Troubleshoot pressure regulators.
- 16.27 Remove and replace pressure regulator.
- 16.28 Troubleshoot door seals/gaskets.
- 16.29 Remove and replace door seal/gasket.
- 16.30 Perform operational check.
- 16.31 Instruct consumer on use and care.

17.0 Install, Troubleshoot, And Repair Dishwashers--The student will be able to:

- 17.01 Install a dishwasher.
- 17.02 Identify components and their function.
- 17.03 Read and interpret schematics and diagrams.
- 17.04 Troubleshoot timers and electronic control or components.
- 17.05 Remove and replace timer and electronic control or component.
- 17.06 Troubleshoot selector switches.
- 17.07 Remove and replace selector switch.
- 17.08 Troubleshoot float switches.
- 17.09 Remove and replace float switch.
- 17.10 Troubleshoot door switches.
- 17.11 Remove and replace door switch.
- 17.12 Troubleshoot motors and components.
- 17.13 Remove and replace motor and component.
- 17.14 Troubleshoot heating elements.
- 17.15 Remove and replace heating element.
- 17.16 Troubleshoot relays.
- 17.17 Remove and replace relay.
- 17.18 Troubleshoot water valves and components.

- 17.19 Remove and replace water valve or component.
- 17.20 Troubleshoot hoses.
- 17.21 Remove and replace hoses.
- 17.22 Troubleshoot pumps and components.
- 17.23 Remove and replace pump or component.
- 17.24 Troubleshoot seals.
- 17.25 Remove and replace seals.
- 17.26 Troubleshoot dispensers and components.
- 17.27 Remove and replace dispenser or component.
- 17.28 Troubleshoot spray arms.
- 17.29 Remove and replace spray arm.
- 17.30 Troubleshoot blower motors.
- 17.31 Remove and replace blower motor.
- 17.32 Troubleshoot thermostats.
- 17.33 Remove and replace thermostat.
- 17.34 Perform operational check.
- 17.35 Instruct consumer on use and care.

18.0 Use information technology tools. -- The students will be able to:

- 18.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
- 18.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
- 18.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
- 18.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

19.0 Describe the importance of professional ethics and legal responsibilities. -- The students will be able to:

- 19.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
- 19.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
- 19.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
- 19.04 Interpret and explain written organizational policies and procedures. ELR 2.0

**Course Number: ACR0046**

**Occupational Completion Point: D**

**Refrigeration Technician – 450 Hours – SOC Code 49-9031**

20.0 Utilize The Fundamentals Of Refrigeration--The student will be able to:

- 20.01 Explain commonly used terms.
- 20.02 Perform heat transfer, measuring and temperature conversions.
- 20.03 Perform pressure measuring and conversion calculations.
- 20.04 Explain the concept of state of matter.
- 20.05 Explain the differences in refrigerants and their uses.
- 20.06 Diagram and explain the functions of the components of basic refrigeration

systems.

20.07 Identify purpose and importance of CFC recover/recycling.

20.08 Identify operation of recovery system components.

20.09 Recover and recycle refrigerants.

21.0 Work With Tubing And Fittings--The student will be able to:

21.01 Identify types and uses of solders and brazing alloys.

21.02 Identify types and sizes of tubing and fittings.

21.03 Measure, cut, flare, swage and bend tubing.

21.04 Soft solder with acetylene.

21.05 Braze with acetylene and oxyacetylene.

21.06 Fabricate replacement sections of tubing for appliances.

22.0 Install, Troubleshoot, And Repair Refrigeration Icemakers And Freezers--The student will be able to:

22.01 Install a refrigerator and a freezer.

22.02 Identify components and their functions.

22.03 Read and interpret schematics and diagrams.

22.04 Troubleshoot gaskets and seals.

22.05 Remove and replace gaskets and seals.

22.06 Troubleshoot light and fan switches.

22.07 Remove and replace light and fan switches.

22.08 Troubleshoot fans.

22.09 Remove and replace fans.

22.10 Troubleshoot the defrost timer.

22.11 Remove and replace the defrost timer.

22.12 Troubleshoot the defrost thermostat.

22.13 Remove and replace the defrost thermostat.

22.14 Troubleshoot the defrost heater.

22.15 Remove and replace the defrost heater.

22.16 Troubleshoot the cold control.

22.17 Remove and replace cold control.

22.18 Troubleshoot icemakers.

22.19 Remove and repair icemakers.

22.20 Use test equipment to determine operating conditions of a refrigeration system.

22.21 Troubleshoot refrigeration system.

22.22 Remove and replace compressors.

22.23 Remove and replace condensers, evaporators, metering devices and dryers.

22.24 Perform operational check.

22.25 Instruct consumers on use and care.

23.0 Install, Troubleshoot, And Repair Window Air Conditioners--The student will be able to:

23.01 Install a window air conditioner.

23.02 Identify components and their functions.

23.03 Read and interpret schematics and diagrams.

23.04 Troubleshoot selector switches.

23.05 Remove and replace selector switches.

23.06 Troubleshoot the thermostats.

- 23.07 Remove and replace the thermostats.
- 23.08 Troubleshoot capacitors.
- 23.09 Remove and replace capacitors.
- 23.10 Troubleshoot the fan motor.
- 23.11 Remove and replace the fan motor.
- 23.12 Troubleshoot the heater.
- 23.13 Remove and replace the heater.
- 23.14 Troubleshoot the deicer.
- 23.15 Remove and replace the deicer.
- 23.16 Troubleshoot the reversing valve.
- 23.17 Remove and replace the reversing valve.
- 23.18 Troubleshoot the compressor.
- 23.19 Remove and replace the compressor.
- 23.20 Use test equipment to determine operating conditions of refrigeration systems.
- 23.21 Perform operational check.
- 23.22 Instruct consumer on use and care.
- 24.0 Explain the importance of employability and entrepreneurship skills. -- The students will be able to:
- 24.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
- 24.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
- 24.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
- 24.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
- 24.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
- 24.06 Identify and exhibit traits for retaining employment. ECD 7.0
- 24.07 Identify opportunities and research requirements for career advancement. ECD 8.0
- 24.08 Research the benefits of ongoing professional development. ECD 9.0
- 24.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0
- 25.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. -- The students will be able to:
- 25.01 Describe the nature and types of business organizations. SY 1.0
- 25.02 Explain the effect of key organizational systems on performance and quality.
- 25.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
- 25.04 Explain the impact of the global economy on business organizations.
- 26.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. -- The students will be able to:
- 26.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
- 26.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
- 26.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
- 26.04 Employ mentoring skills to inspire and teach others. LT 5.0

2011 – 2012

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Residential Appliance and Refrigeration Repair 1  
**Course Number:** 8706010  
**Course Credit:** 1

**Course Description:**

This course is designed to provide instruction in laboratory practices and electrical and gas fundamentals.

**01.0 Apply Proper Laboratory Practices--The student will be able to:**

- 01.01 Use industry accepted safety practices.
- 01.02 Explain appropriate first aid for electrical shock and potential shop accidents.
- 01.03 Perform appropriate record keeping functions.
- 01.04 Explain and demonstrate the proper use and care of hand tools.
- 01.05 Explain and demonstrate the proper use and care of meters and test equipment.
- 01.06 Explain and demonstrate the proper use and care of power tools.

**02.0 Apply Electrical Fundamentals--The student will be able to:**

- 02.01 Explain electron theory.
- 02.02 Identify circuits from schematics and diagrams using commonly accepted symbols.
- 02.03 Explain Ohm's Law.
- 02.04 Measure resistance.
- 02.05 Measure voltage.
- 02.06 Measure amperage.
- 02.07 Measure wattage.
- 02.08 Explain and construct series circuits.
- 02.09 Explain and construct parallel circuits.
- 02.10 Explain and construct combination circuits.
- 02.11 Explain inductance and magnetism and their relationship to electric motors.
- 02.12 Describe how electric motors function.
- 02.13 Explain the function of capacitors and how to troubleshoot them.
- 02.14 Explain the function of relay and switches and how to troubleshoot them.
- 02.15 Explain the function of capacitors and transformers in major appliances.
- 02.16 Explain the concept and rationale of motor protection.
- 02.17 Describe how a compressor functions.

**03.0 Apply Gas Fundamentals--The student will be able to:**

- 03.01 Explain common use terms.
- 03.02 Explain different types of gas.
- 03.03 Explain specific gravity.
- 03.04 Diagram and explain basic components of a gas burner.
- 03.05 Explain requirements for burning.
- 03.06 Perform pressure tests on gas systems.



2011 – 2012

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Residential Appliance and Refrigeration Repair 2  
**Course Number:** 8706020  
**Course Credit:** 1

**Course Description:**

This course is designed to provide instruction in laboratory practices as well as basic communication, math, science and employability skills.

04.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. -- The students will be able to:

- |       |   |         |
|-------|---|---------|
| 04.01 | Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. | CM 1.0  |
| 04.02 | Locate, organize and reference written information from various sources.  | CM 3.0  |
| 04.03 | Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences.   | CM 5.0  |
| 04.04 | Interpret verbal and nonverbal cues/behaviors that enhance communication.   | CM 6.0  |
| 04.05 | Apply active listening skills to obtain and clarify information.  | CM 7.0  |
| 04.06 | Develop and interpret tables and charts to support written and oral communications.   | CM 8.0  |
| 04.07 | Exhibit public relations skills that aid in achieving customer satisfaction.  | CM 10.0 |

05.0 Demonstrate mathematics knowledge and skills. -- The students will

- |       |  |       |
|-------|--|-------|
| 05.01 | be able to:  | AF3.0 |
| 05.02 | Demonstrate knowledge of arithmetic operations.                                    | AF3.2 |
| 05.03 | Analyze and apply data and measurements to solve problems and interpret documents. | AF3.4 |
| 05.04 | Construct charts/tables/graphs using functions and data.                           | AF3.5 |

06.0 Demonstrate science knowledge and skills. -- The students will be

- |       |   |       |
|-------|---|-------|
| 06.01 | able to:  | AF4.0 |
| 06.02 | Discuss the role of creativity in constructing scientific questions, methods and explanations.  | AF4.1 |
| 06.03 | Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. | AF4.3 |

07.0 Demonstrate personal money-management concepts, procedures, and strategies. -- The students will be able to:

- |       |  |        |
|-------|--|--------|
| 07.01 | Identify and describe the services and legal responsibilities of financial institutions. | FL 2.0 |
| 07.02 | Describe the effect of money management on personal and career goals.                    | FL 3.0 |

- |       |   |       |
|-------|---|-------|
| 07.03 | Develop a personal budget and financial goals.                      | FL3.1 |
| 07.04 | Complete financial instruments for making deposits and withdrawals. | FL3.2 |
| 07.05 | Maintain financial records.   | FL3.3 |
| 07.06 | Read and reconcile financial statements.                            | FL3.4 |
| 07.07 | Research, compare and contrast investment opportunities.            |       |

2011 – 2012

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Residential Appliance and Refrigeration Repair 3  
**Course Number:** 8706030  
**Course Credit:** 1

**Course Description:**

This course is designed to provide instruction in installing, troubleshooting and repairing clothes dryers.

08.0 Install, Troubleshoot, And Repair Electric Clothes Dryer--The student will be able to:

- 08.01 Install an electric dryer.
- 08.02 Identify components and their function.
- 08.03 Troubleshoot timers and components.
- 08.04 Remove and replace timer or component.
- 08.05 Troubleshoot drive motors and components.
- 08.06 Remove and replace drive motor or component.
- 08.07 Troubleshoot heating elements and components.
- 08.08 Remove and replace element or component.
- 08.09 Remove and replace thermostats.
- 08.10 Troubleshoot thermostats.
- 08.11 Troubleshoot bearings and components.
- 08.12 Remove and replace bearing or component.
- 08.13 Troubleshoot belts and pulleys.
- 08.14 Remove and replace belt or pulley.
- 08.15 Troubleshoot rollers and glides.
- 08.16 Remove and replace roller or glides.
- 08.17 Troubleshoot filters.
- 08.18 Remove and replace filter.
- 08.19 Troubleshoot seals.
- 08.20 Remove and replace seals.
- 08.21 Troubleshoot push-to-start switch.
- 08.22 Remove and replace push-to-start switch.
- 08.23 Troubleshoot door switches.
- 08.24 Remove and replace door switches.
- 08.25 Troubleshoot selector switches.
- 08.26 Remove and replace selector switches.
- 08.27 Remove and replace sensor and electronic control.
- 08.28 Troubleshoot sensor and electronic control.
- 08.29 Perform operational check.
- 08.30 Instruct consumer on use and care.

09.0 Install, Troubleshoot And Repair Gas Clothes Dryers--The student will be able to:

- 09.01 Install a gas dryer.
- 09.02 Identify components and their function.
- 09.03 Read and interpret schematics and diagrams.

- 09.04 Troubleshoot electric ignition components.
- 09.05 Remove and replace electric ignition components.
- 09.06 Troubleshoot timers and electronic controls and components.
- 09.07 Remove and replace timer electronic control or component.
- 09.08 Troubleshoot drive motors.
- 09.09 Remove and replace drive motor.
- 09.10 Troubleshoot gas burner.
- 09.11 Remove and replace gas burner.
- 09.12 Troubleshoot thermostats.
- 09.13 Remove and replace thermostat.
- 09.14 Troubleshoot gas valves.
- 09.15 Remove and replace gas valve.
- 09.16 Troubleshoot thermocouples.

2011 – 2012

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Residential Appliance and Refrigeration Repair 4  
**Course Number:** 8706040  
**Course Credit:** 1

**Course Description:**

This course is designed to provide advanced instruction in installing, troubleshooting and repairing clothes dryers as well as washers.

09.0 Install, Troubleshoot And Repair Gas Clothes Dryers--The student will be able to:

- 09.17 Remove and replace thermocouple.
- 09.18 Troubleshoot flame switch.
- 09.19 Remove and replace flame switch.
- 09.20 Troubleshoot bearing assemblies and components.
- 09.21 Remove and replace bearing or component.
- 09.22 Troubleshoot belts and pulleys.
- 09.23 Remove and replace belt or pulley.
- 09.24 Troubleshoot rollers and glides.
- 09.25 Remove and replace roller or glide.
- 09.26 Troubleshoot seals.
- 09.27 Remove and replace seals.
- 09.28 Troubleshoot door switches.
- 09.29 Remove and replace door switch.
- 09.30 Troubleshoot selector switches.
- 09.31 Remove and replace selector switch.
- 09.32 Troubleshoot motor switches.
- 09.33 Remove and replace motor switch.
- 09.34 Perform operational check.
- 09.35 Instruct consumer on use and care.

10.0 Install, Troubleshoot And Repair Clothes Washers--The student will be able to:

- 10.01 Install a clothes washer.
- 10.02 Identify components and their function.
- 10.03 Read and interpret schematics and diagrams.
- 10.04 Troubleshoot timers and components.
- 10.05 Remove and replace timer or component.
- 10.06 Troubleshoot selector switches.
- 10.07 Remove and replace selector switch.
- 10.08 Troubleshoot water level switches and components.
- 10.09 Remove and replace water level switch or component.
- 10.10 Troubleshoot water inlet valves and components.
- 10.11 Remove and replace water inlet valve or component.
- 10.12 Troubleshoot hoses.
- 10.13 Remove and replace hoses.
- 10.14 Troubleshoot water pumps and components.

- 10.15 Remove and replace water pump or component.
  - 10.16 Troubleshoot filters.
  - 10.17 Remove and replace filter.
  - 10.18 Troubleshoot drive motors and components.
  - 10.19 Remove and replace drive motor or component.
  - 10.20 Troubleshoot belts and pulleys.
  - 10.21 Remove and replace belt or pulley.
  - 10.22 Troubleshoot transmissions and components.
  - 10.23 Remove and replace transmission or component.
  - 10.24 Troubleshoot bearings.
  - 10.25 Remove and replace bearings.
  - 10.26 Troubleshoot water and oil seals.
  - 10.27 Remove and replace water and oil seals.
  - 10.28 Troubleshoot clutches.
  - 10.29 Remove and replace clutch.
  - 10.30 Troubleshoot brakes.
  - 10.31 Remove and replace brake.
  - 10.32 Troubleshoot lid switches and components.
  - 10.33 Remove and replace lid switch or component.
  - 10.34 Perform operational check.
  - 10.35 Instruct consumer on use and care.
- 11.0 Demonstrate language arts knowledge and skills. -- The students will be able to: AF 2.0
- 11.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
  - 11.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
  - 11.03 Present information formally and informally for specific purposes and audiences. AF2.9
- 12.0 Solve problems using critical thinking skills, creativity and innovation. -- The students will be able to:
- 12.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
  - 12.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
  - 12.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
  - 12.04 Conduct technical research to gather information necessary for decision-making. PS 4.0
- 13.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. -- The students will be able to:
- 13.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
  - 13.02 Explain emergency procedures to follow in response to workplace accidents.
  - 13.03 Create a disaster and/or emergency response plan. SHE 2.0

2011 – 2012

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Residential Appliance and Refrigeration Repair 5  
**Course Number:** 8706050  
**Course Credit:** 1

**Course Description:**

This course is designed to provide instruction in installing, troubleshooting and repairing electric ranges.

14.0 Install, Troubleshoot, And Repair Electric Ranges--The student will be able to:

- 14.01 Install an electric range.
- 14.02 Describe the operation and application of components.
- 14.03 Read and interpret schematics and diagrams.
- 14.04 Troubleshoot clocks/timers.
- 14.05 Remove and replace clocks/timers.
- 14.06 Troubleshoot surface unit switches and components.
- 14.07 Remove and replace surface switches or components.
- 14.08 Troubleshoot oven thermostats and components.
- 14.09 Remove and replace oven thermostats or components.
- 14.10 Troubleshoot oven selector switches and components.
- 14.11 Remove and replace oven selector switches or components.
- 14.12 Troubleshoot surface units and components.
- 14.13 Remove and replace surface units or components.
- 14.14 Troubleshoot bake and broil elements.
- 14.15 Remove and replace bake and broil elements.
- 14.16 Troubleshoot electronic controls.
- 14.17 Remove and replace electronic controls.
- 14.18 Troubleshoot time delay relays.
- 14.19 Remove and replace time delay relay.
- 14.20 Troubleshoot oven sensors and components.
- 14.21 Remove and replace oven sensor or component.
- 14.22 Troubleshoot door locks and components.
- 14.23 Remove and replace door lock or component.
- 14.24 Troubleshoot fans.
- 14.25 Remove and replace fan.
- 14.26 Troubleshoot gaskets and seals.
- 14.27 Remove and replace gasket or seals.
- 14.28 Perform operational check.
- 14.29 Instruct consumer on use and care.

2011 – 2012

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Residential Appliance and Refrigeration Repair 6  
**Course Number:** 8706060  
**Course Credit:** 1

**Course Description:**

This course is designed to provide instruction in installing, troubleshooting and repairing gas ranges as well as microwave ovens.

15.0 Install, Troubleshoot, And Repair Microwave Ovens--The student will be able to:

- 15.01 Install a microwave oven.
- 15.02 Describe the operation and application of components.
- 15.03 Read and interpret schematics and diagrams.
- 15.04 Troubleshoot clocks/timers/electronic controls.
- 15.05 Remove and replace clocks/timers/electronic controls.
- 15.06 Troubleshoot door switches.
- 15.07 Remove and replace door switches.
- 15.08 Troubleshoot relays.
- 15.09 Remove and replace relays.
- 15.10 Troubleshoot thermal protectors.
- 15.11 Remove and replace thermal protectors.
- 15.12 Troubleshoot the power transformer.
- 15.13 Remove and replace the power transformer.
- 15.14 Troubleshoot the high voltage diode.
- 15.15 Remove and replace the high voltage diode.
- 15.16 Troubleshoot the capacitor.
- 15.17 Remove and replace the capacitor.
- 15.18 Troubleshoot the magnetron.
- 15.19 Remove and replace the magnetron.
- 15.20 Troubleshoot the fan.
- 15.21 Remove and replace the fan.
- 15.22 Troubleshoot the stirrer blade and motor.
- 15.23 Remove and replace the stirrer blade and motor.
- 15.24 Troubleshoot the turntable motor.
- 15.25 Remove and replace the turntable motor.
- 15.26 Perform operational check.
- 15.27 Instruct consumer on use and care.

16.0 Install, Troubleshoot, And Repair Gas Ranges--The student will be able to:

- 16.01 Install a gas range.
- 16.02 Identify components and their function.
- 16.03 Read and interpret schematics and diagrams.
- 16.04 Troubleshoot clocks/timers/electronic controls.
- 16.05 Remove and replace clocks/timers/electronic controls.
- 16.06 Troubleshoot oven thermostats.



- 16.07 Remove and replace oven thermostats.
- 16.08 Troubleshoot oven selector switches.
- 16.09 Remove and replace oven selector switches.
- 16.10 Troubleshoot self-clean relays.
- 16.11 Remove and replace self-clean relays.
- 16.12 Troubleshoot oven sensors.
- 16.13 Remove and replace oven sensor.
- 16.14 Troubleshoot door locks.
- 16.15 Remove and replace door lock.
- 16.16 Troubleshoot fans.
- 16.17 Remove and replace fan.
- 16.18 Troubleshoot gas valves for surface burners.
- 16.19 Remove and replace gas valve for surface burner.
- 16.20 Troubleshoot gas valve for oven.
- 16.21 Remove and replace gas valve for oven.
- 16.22 Troubleshoot electric igniters.
- 16.23 Remove and replace electric igniter.
- 16.24 Troubleshoot safety valves.
- 16.25 Remove and replace safety valve.
- 16.26 Troubleshoot pressure regulators.
- 16.27 Remove and replace pressure regulator.
- 16.28 Troubleshoot door seals/gaskets.
- 16.29 Remove and replace door seal/gasket.
- 16.30 Perform operational check.
- 16.31 Instruct consumer on use and care.

2011 – 2012

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Residential Appliance and Refrigeration Repair 7  
**Course Number:** 8706070  
**Course Credit:** 1

**Course Description:**

This course is designed to provide instruction in installing, troubleshooting and repairing dishwashers.

17.0 Install, Troubleshoot, And Repair Dishwashers--The student will be able to:

- 17.01 Install a dishwasher.
- 17.02 Identify components and their function.
- 17.03 Read and interpret schematics and diagrams.
- 17.04 Troubleshoot timers and electronic control or components.
- 17.05 Remove and replace timer and electronic control or component.
- 17.06 Troubleshoot selector switches.
- 17.07 Remove and replace selector switch.
- 17.08 Troubleshoot float switches.
- 17.09 Remove and replace float switch.
- 17.10 Troubleshoot door switches.
- 17.11 Remove and replace door switch.
- 17.12 Troubleshoot motors and components.
- 17.13 Remove and replace motor and component.
- 17.14 Troubleshoot heating elements.
- 17.15 Remove and replace heating element.
- 17.16 Troubleshoot relays.
- 17.17 Remove and replace relay.
- 17.18 Troubleshoot water valves and components.
- 17.19 Remove and replace water valve or component.
- 17.20 Troubleshoot hoses.
- 17.21 Remove and replace hoses.
- 17.22 Troubleshoot pumps and components.
- 17.23 Remove and replace pump or component.
- 17.24 Troubleshoot seals.
- 17.25 Remove and replace seals.
- 17.26 Troubleshoot dispensers and components.
- 17.27 Remove and replace dispenser or component.
- 17.28 Troubleshoot spray arms.
- 17.29 Remove and replace spray arm.
- 17.30 Troubleshoot blower motors.
- 17.31 Remove and replace blower motor.
- 17.32 Troubleshoot thermostats.
- 17.33 Remove and replace thermostat.
- 17.34 Perform operational check.
- 17.35 Instruct consumer on use and care.

- 18.0 Use information technology tools. -- The students will be able to:
- 18.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
  - 18.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
  - 18.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
  - 18.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0
- 19.0 Describe the importance of professional ethics and legal responsibilities. -- The students will be able to:
- 19.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
  - 19.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
  - 19.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
  - 19.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Residential Appliance and Refrigeration Repair 8  
**Course Number:** 8706080  
**Course Credit:** 1

**Course Description:**

This course is designed to provide instruction in basic refrigeration.

20.0 Utilize The Fundamentals Of Refrigeration--The student will be able to:

- 20.01 Explain commonly used terms.
- 20.02 Perform heat transfer, measuring and temperature conversions.
- 20.03 Perform pressure measuring and conversion calculations.
- 20.04 Explain the concept of state of matter.
- 20.05 Explain the differences in refrigerants and their uses.
- 20.06 Diagram and explain the functions of the components of basic refrigeration systems.
- 20.07 Identify purpose and importance of CFC recover/recycling.
- 20.08 Identify operation of recovery system components.
- 20.09 Recover and recycle refrigerants.

21.0 Work With Tubing And Fittings--The student will be able to:

- 21.01 Identify types and uses of solders and brazing alloys.
- 21.02 Identify types and sizes of tubing and fittings.
- 21.03 Measure, cut, flare, swage and bend tubing.
- 21.04 Soft solder with acetylene.
- 21.05 Braze with acetylene and oxyacetylene.
- 21.06 Fabricate replacement sections of tubing for appliances.

2011 – 2012

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Residential Appliance and Refrigeration Repair 9  
**Course Number:** 8706090  
**Course Credit:** 1

**Course Description:**

This course is designed to provide instruction in installing, troubleshooting and repairing icemakers and freezers.

22.0 Install, Troubleshoot, And Repair Refrigeration Icemakers And Freezers--The student will be able to:

- 22.01 Install a refrigerator and a freezer.
- 22.02 Identify components and their functions.
- 22.03 Read and interpret schematics and diagrams.
- 22.04 Troubleshoot gaskets and seals.
- 22.05 Remove and replace gaskets and seals.
- 22.06 Troubleshoot light and fan switches.
- 22.07 Remove and replace light and fan switches.
- 22.08 Troubleshoot fans.
- 22.09 Remove and replace fans.
- 22.10 Troubleshoot the defrost timer.
- 22.11 Remove and replace the defrost timer.
- 22.12 Troubleshoot the defrost thermostat.
- 22.13 Remove and replace the defrost thermostat.
- 22.14 Troubleshoot the defrost heater.
- 22.15 Remove and replace the defrost heater.
- 22.16 Troubleshoot the cold control.
- 22.17 Remove and replace cold control.
- 22.18 Troubleshoot icemakers.
- 22.19 Remove and repair icemakers.
- 22.20 Use test equipment to determine operating conditions of a refrigeration system.
- 22.21 Troubleshoot refrigeration system.
- 22.22 Remove and replace compressors.
- 22.23 Remove and replace condensers, evaporators, metering devices and dryers.
- 22.24 Perform operational check.
- 22.25 Instruct consumers on use and care.

2011 – 2012

**Florida Department of Education  
Student Performance Standards**

**Course Title:** Residential Appliance and Refrigeration Repair 10  
**Course Number:** 8706100  
**Course Credit:** 1

**Course Description:**

This course is designed to provide instruction in installing, troubleshooting and repairing window air conditioners.

23.0 Install, Troubleshoot, And Repair Window Air Conditioners--The student will be able to:

- 23.01 Install a window air conditioner.
- 23.02 Identify components and their functions.
- 23.03 Read and interpret schematics and diagrams.
- 23.04 Troubleshoot selector switches.
- 23.05 Remove and replace selector switches.
- 23.06 Troubleshoot the thermostats.
- 23.07 Remove and replace the thermostats.
- 23.08 Troubleshoot capacitors.
- 23.09 Remove and replace capacitors.
- 23.10 Troubleshoot the fan motor.
- 23.11 Remove and replace the fan motor.
- 23.12 Troubleshoot the heater.
- 23.13 Remove and replace the heater.
- 23.14 Troubleshoot the deicer.
- 23.15 Remove and replace the deicer.
- 23.16 Troubleshoot the reversing valve.
- 23.17 Remove and replace the reversing valve.
- 23.18 Troubleshoot the compressor.
- 23.19 Remove and replace the compressor.
- 23.20 Use test equipment to determine operating conditions of refrigeration systems.
- 23.21 Perform operational check.
- 23.22 Instruct consumer on use and care.

24.0 Explain the importance of employability and entrepreneurship skills. -- The students will be able to:

- 24.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
- 24.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
- 24.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
- 24.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
- 24.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
- 24.06 Identify and exhibit traits for retaining employment. ECD 7.0
- 24.07 Identify opportunities and research requirements for career advancement. ECD 8.0
- 24.08 Research the benefits of ongoing professional development. ECD 9.0

- 24.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0
- 25.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. -- The students will be able to:
- 25.01 Describe the nature and types of business organizations. SY 1.0
  - 25.02 Explain the effect of key organizational systems on performance and quality.
  - 25.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
  - 25.04 Explain the impact of the global economy on business organizations.
- 26.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. -- The students will be able to:
- 26.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
  - 26.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
  - 26.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
  - 26.04 Employ mentoring skills to inspire and teach others. LT 5.0