

FLORIDA STATE COLLEGE AT JACKSONVILLE

NON-COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: ACR 0102

COURSE TITLE: Applied Electricity and Schematics

PREREQUISITE(S): None

COREQUISITE(S): None

STUDENT ADVISING NOTES: Suggested Course: ACR 0100

TOTAL CONTACT HOURS: 125 (112-138)

(For Office Use Only:
Vocational Credits 4.0)

FACULTY WORKLOAD POINTS: 4.16

STANDARDIZED CLASS SIZE
ALLOCATION: 20

COURSE DESCRIPTION:

This course is a continuation of Basic Electricity and Schematics and is designed to teach entry-level job skills. Topics include heat pumps, gas and oil furnaces, electric furnaces, straight cooling units and building electrical control panels.

SUGGESTED TEXT(S): Carrier GTR, Chapters 1-16, Carrier,
Refrigeration and Air Conditioning Technology, 4th edition,
Whitman - Johnson - Tomczyk Copyright 2000

IMPLEMENTATION DATE: Fall Term, 1989 (901)

REVIEW OR MODIFICATION DATE: Fall Term, 1993 (941)
Fall Term, 1998
Fall Term, 2002 (20031)

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
I. Carrier Wiring Build-Ups	21
A. Packaged heat pumps	
B. Split heat pumps	
C. Gas furnaces	
D. Oil furnaces	
E. Water source heat pumps	
F. Electric furnaces	
G. Straight cooling units	
II. Westinghouse Wiring Build-Ups	21
A. Packaged heat pumps	
B. Split heat pumps	
C. Gas furnaces	
D. Oil furnaces	
E. Water source heat pumps	
F. Electric furnaces	
G. Straight cooling units	
III. Trans Wiring Build-Ups	21
A. Packaged heat pumps	
B. Split heat pumps	
C. Gas furnaces	
D. Oil furnaces	
E. Water source heat pumps	
F. Electric furnaces	
G. Straight cooling units	
IV. Heil Wiring Build-Ups	20
A. Packaged heat pumps	
B. Split heat pumps	
C. Gas furnaces	
D. Oil furnaces	
E. Water source heat pumps	
F. Electric furnaces	
G. Straight cooling units	
V. Chrysler Wiring Build-Ups	21
A. Packaged heat pumps	
B. Split heat pumps	
C. Gas furnaces	
D. Oil furnaces	
E. Water source heat pumps	
F. Electric furnaces	
G. Straight cooling units	

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
VI. Building Electrical Control Panels A. Packaged heat pumps B. Split heat pumps C. Gas furnaces D. Oil furnaces E. Water source heat pumps F. Electric furnaces G. Straight cooling units	21

PROGRAM TITLE: Commercial Heating and Air Conditioning Technology

COURSE TITLE: Applied Electricity and Schematics

CIP NUMBER: 0647.020100

LIST PERFORMANCE STANDARD ADDRESSED:

NUMBER(S): TITLES(S):

01.0 KNOW THE HISTORY/CONCEPTS OF REFRIGERATION AND AIR CONDITIONING -- The student will be able to:

01.06 Describe some of today's current issues regarding air conditioning--industry concerns and future ramifications.

04.0 DEMONSTRATE SAFE WORKING PRACTICES AND PROCEDURES -- The student will be able to:

04.02 Describe the reasons for regular safety meetings.

04.03 Explain the reasons for company safety policies.

04.05 Explain the need for employee background checks and medical examinations.

04.06 Identify and use appropriate personal safety equipment.

04.07 Identify and use proper fire extinguishers and other such safety devices.

04.08 Identify and use emergency first aid procedures.

04.09 Identify and use safe handling practices as they relate to hazardous and volatile fluids.

04.20 Identify and use OSHA safety practices when working near moving equipment.

04.21 Identify correct locations and procedures for hanging fire extinguishers.

04.22 Identify and use OSHA safety practices relating to a ground fault circuit interrupter.

04.23 Identify and use OSHA safety practices relating to frayed cords.

04.24 Identify and use OSHA safety practices as they relate to the length and size of the extension cord.

04.25 Identify and practice OSHA safety procedures when working with electricity around water.

04.26 Define and use safety procedures when working with gases and combustibles.

05.0 DEMONSTRATE APPROPRIATE USE OF TOOLS AND ACCESSORIES -- The student will be able to:

05.01 Identify and use basic tools and accessories.

05.02 Identify and use power tools.

05.03 Identify and use fasteners.

05.05 Describe and apply appropriate maintenance processes for tools and accessories.

05.06 Identify and use specialized tools of the trade.

08.0 DEMONSTRATE A WORKING KNOWLEDGE IN BASIC ELECTRICITY AND ELECTRICAL COMPONENTS

- The student will be able to:

08.04 Measure wattage, resistance, voltage and amperage using appropriate meter.

08.05 Troubleshoot and explain the function of relays.

08.06 Troubleshoot and explain the function of contactors.

LIST PERFORMANCE STANDARD ADDRESSED: (Continued)

NUMBER(S): TITLES(S):

- 08.07 Troubleshoot and explain the function of a capacitor.
- 08.08 Troubleshoot and explain the function of a defrost timer.
- 08.11 Troubleshoot and explain the function of thermostats.

09.0 DEMONSTRATE A WORKING KNOWLEDGE IN RESIDENTIAL CONTROL SYSTEM HEATING/COOLING

- The student will be able to:

- 09.02 Wire a complete heating/cooling system, line and low voltage.
- 09.03 Connect field control wiring on heat pump installation.
- 09.04 Identify and troubleshoot controls for heating and cooling systems.
- 09.05 Interpret and apply a schematic wiring diagram of a low voltage control system.
- 09.06 Adjust heat anticipator on thermostat.
- 09.07 Identify, install and troubleshoot a single stage heat and single stage cool thermostat.
- 09.08 Identify, install and troubleshoot a two stage heat and two stage cool thermostat.
- 09.09 Analyze electronic circuit containing power source, control card, sensor and control device.
- 09.15 Connect a single-phase motor.
- 09.16 Reverse rotation of single-phase motor.
- 09.17 Connect three-phase motor.
- 09.18 Correct the causes of electrical problems.
- 09.19 Identify and correct the causes of mechanical problems.

13.0 DEMONSTRATE A WORKING KNOWLEDGE OF CODES AND STANDARDS -- The student will be able to:

- 13.01 Describe the reason for codes.
- 13.02 Discuss local codes.
- 13.03 Discuss standard codes.
- 13.04 Discuss uniform codes.
- 13.05 Identify codes and standards for the applicable area, locality or state.
- 13.06 Explain the relationship between codes and manufacturers' installation instructions.
- 13.07 Identify the purposes of the Air Cond. & Refrig. Inst., American Soc. of Heating, Refrig. & Air Cond. Engrs. and Sheet Metal Air Cond. Contractors Natl. Assoc.

15.0 DEMONSTRATE A WORKING KNOWLEDGE IN AIR CONDITIONING START- UP AND SERVICE PROBLEM ANALYSIS -- The student will be able to:

- 15.02 Determine equipment electrical requirements.
- 15.03 Identify and use proper safety procedures when using tools and test equipment.
- 15.04 Explain local codes and ordinances.

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

- 16.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

LIST PERFORMANCE STANDARD ADDRESSED: (Continued)

NUMBER(S): TITLES(S):

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP -- The student will be able to:

17.07 Demonstrate knowledge of state licensing.



NOTE: Use either the Tab key or mouse click to move from field to field. The box will expand to accommodate your entry.

Section 1	
COURSE PREFIX AND NUMBER: ACR-0102	SEMESTER CREDIT HOURS (CC): CONTACT HOURS (NCC): <u>125</u>
COURSE TITLE: Basic Applied Electricity and Schematics	

Section 2
TYPE OF COURSE: (Click on the box to check all that apply)

<input type="checkbox"/> AA Elective	<input type="checkbox"/> AS Required Professional Course	<input type="checkbox"/> College Prep
<input type="checkbox"/> AS Professional Elective	<input type="checkbox"/> AAS Required Professional Course	<input checked="" type="checkbox"/> Technical Certificate
<input type="checkbox"/> Other _____	<input checked="" type="checkbox"/> PSAV	<input type="checkbox"/> Apprenticeship
<input type="checkbox"/> General Education: (For General Education courses, you must also complete Section 3 and Section 7)		

Section 3 (If applicable)
INDICATE BELOW THE DISCIPLINE AREA FOR GENERAL EDUCATION COURSES:

<input type="checkbox"/> Communications	<input type="checkbox"/> Social & Behavioral Sciences	<input type="checkbox"/> Mathematics
<input type="checkbox"/> Natural Sciences	<input type="checkbox"/> Humanities	

Section 4
INTELLECTUAL COMPETENCIES:

<input checked="" type="checkbox"/> Reading	<input checked="" type="checkbox"/> Speaking	<input checked="" type="checkbox"/> Critical Analysis	<input type="checkbox"/> Quantitative Skills	<input type="checkbox"/> Scientific Method of Inquiry
<input type="checkbox"/> Writing	<input checked="" type="checkbox"/> Listening	<input type="checkbox"/> Information Literacy	<input type="checkbox"/> Ethical Judgment	<input type="checkbox"/> Working Collaboratively

Section 5	
LEARNING OUTCOMES	METHOD OF ASSESSMENT
<ul style="list-style-type: none"> Demonstrate the ability to perform basic installation and troubleshooting skills using the appropriate test and measuring equipment. 	Students will participate in Lab discussions and will be given simulated scenarios on equipment in the lab classes. Assessment by instructor 75% of possible 100 points to achieve a passing score.
<ul style="list-style-type: none"> Evaluate the requirements of a maintenance task and complete it in a timely manner meeting industry standards. 	Students will be evaluated on time taken to find the problem or make the repair and or quality of the repair. Assessment by instructor, 75% of possible 100 points to achieve a passing score.
<ul style="list-style-type: none"> Be able to understand and know how to apply basic safety and shop safety skills 	Multiple choice, fill in blank & essay question test. 75% of possible 100 points to achieve a passing score. Plus observations of student s applied safety skills. Assessment by instructor.
<ul style="list-style-type: none"> Demonstrate knowledge of control wiring for heat pumps, gas and oil furnaces, electric furnaces, straight cooling units and building electrical control panels 	Students will participate in Lab discussions and will be given simulated scenarios on equipment in the lab classes. Assessment by instructor 75% of possible 100 points to achieve a passing score.
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Section 6
Name of Person Completing This Form: Gary Krupa Date: 11/2009