

SUBJECT CONTENTS: Motors starting, winding types
Two speed, three speed. Variable frequency drives.

METHODS/
TECHNIQUES: Class room, systems room, electrical room, PDF.

RESOURCES: Motors & Controls in shop and Electrical room
RACT

EVALUATION: Question end of RACT unit 20

OTHER Handouts, motors and controls
Systems room and electrical room

**DAY 4 SUBJECT: Package system vs. split systems
Air and water source heat pumps schematic reading, computer
augmented study.
Electrical schematic**

GOAL: For student to understand the difference between systems, air, water
schematic drawing and reading.

SUBJECT CONTENTS: RACT 43 drawing in computer room

METHODS/
TECHNIQUES: Classroom, system room, computer room

RESOURCES: RACT 43
Handouts
Computer course

EVALUATION: Question page RACT 43

OTHER Handout
Diagrams
RACT 43

DAY 5 SUBJECT: Identify various refrigeration system components

GOAL: For students to understand refrigeration leak, check and troubleshoot systems,
computer augmented using constructor software.

SUBJECT CONTENTS: PBF's troubleshoot system & survey
Split systems
Computer augmented electrical

METHODS/
TECHNIQUES: Hands-on troubleshooting in teams of 4 in systems room.
Classroom, lecture.

RESOURCES: PBF's system room equipment
Computer room augmentation electrical

EVALUATION: Evaluation of computer generated drawing and completion of PBF's

OTHER Handouts
Systems room equipment
Computer room software

**DAY 6 SUBJECT: Troubleshooting of refrigeration systems
PBF's**

GOAL: For students to be able to troubleshoot existing refrigeration, A/C systems
Toggle wiring. Wire toggle switch boards in systems room.

SUBJECT CONTENTS: A/C & Refrigeration unites in systems room
Wire toggle boards

METHODS/
TECHNIQUES: Hands-on troubleshooting
Hands-on wiring of boards

RESOURCES: Equipment in system room
RACT
Toggle boards

EVALUATION: PBF completion grading

OTHER Handouts
Completion of boards

**DAY 7 SUBJECT: Controls and switches
Schematic development of circuits**

GOAL: For student to understand controls SPDT switches. Control and different
voltage.
Schematic development

SUBJECT CONTENTS: DPST switches, control circuits that contain various voltages and switches

METHODS/
TECHNIQUES: PBF, systems room, lecture room
Computer room, electrical room

RESOURCES: Systems room equipment, computer room software.
Electrical (controls in electric room)

EVALUATION: PBF completion computer room completion

OTHER Handouts

**DAY 8 SUBJECT: Make equipment list and identify components of HVAC system. VAV
boxes and chiller package system.**

GOAL: For student to be able to identify and understand functions of units in systems
room.

SUBJECT CONTENTS: VAV boxes, chiller, package system and built up system
Computer, smoke purge system, survey data into computer.

METHODS/
TECHNIQUES: PBF' unites in systems room
Computer data input

RESOURCES: System room equipment
Computer room
RACT unit 17

EVALUATION: Completion of PBF's and data input
Question end of unit 17

**DAY 9 SUBJECT: Economizers, freeze protection demand controls
Toggle wiring**

GOAL: For students to be able to understand and troubleshoot economizers, freeze protectors and demand controls
Different toggle switches
DPST, SPST, SPDT, etc.

SUBJECT CONTENTS: Systems room equipment
RACT unit 19, unit 20

METHODS/
TECHNIQUES: Lecture, systems room, PBF's
Computer room

RESOURCES: RACT
Systems room
Computer software

EVALUATION: Completion of PBF's
Completion of computer drawing

**DAY 10 SUBJECT: Freeze protection and demand control ventilation II wire
Modify and troubleshooting**

GOAL: PBF
Survey and troubleshoot a unit, split system and built up HVAC system

SUBJECT CONTENTS: Equipment in systems room

METHODS/
TECHNIQUES: Systems room survey and troubleshoot system in groups of 4.

RESOURCES: Systems room equipment

EVALUATION: Completion of PBF's

DAY 11 SUBJECT: Survey and troubleshoot rooftop, split system and built up systems

GOAL: For students to understand survey and troubleshooting of rooftop, split systems and package systems
Electrical switches and controls

SUBJECT CONTENTS: Units in systems room
Lecture room
Computer room

METHODS/
Lecture room, computer software and hands-on troubleshooting. PBF's.

TECHNIQUES:

RESOURCES: RACT
Computer software
Equipment in systems room

EVALUATION: Completion of PBF
Completion of computer projects
Handouts

DAY 12 SUBJECT: Install controls and understanding operation.

GOAL: For students to install reverse acting controls, tower fan cycling, low ambient and motor master controls

SUBJECT CONTENTS: Reverse acting pressure control. Tower fan cycling control and low ambient controls on split system units. Controlling head pressure in low ambient conditions.

METHODS/
TECHNIQUES: PBF's

RESOURCES: Systems room
Handouts on different types of controls

EVALUATION: Completion of PBF's

**DAY 13 SUBJECT: Complete PBF's from class 12
Installation of motorized valves and actuators, water pumps and
compressor valve plates.**

GOAL: For students to perform hands-on replacement of controls, valves, and compressor repair.

SUBJECT CONTENTS: PBF's motorized valves, actuator water pumps, and compressors.

METHODS/
TECHNIQUES: System room hands-on replacements
Lecture room
Parts replacement

RESOURCES: RACT
Handouts
Equipment room

EVALUATION: Completion of PBF's

DAY 14 SUBJECT: Final Exam

GOAL: Students present finished notebooks

OBJECTIVES: Evaluation of PBF's and notebooks

METHODS/
TECHNIQUES: Exam and notebooks (evaluation)