SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: ENGY 230 Department: Energy Systems Technology

Course Title: Energy Systems Lab 2 Semester: Spring Year: 1997

Objectives/Competencies

Course Objective	Competencies
1. Application of hot water zoning.	1. Explain how to replace electric zone valve head. 2. Adjust heat anticipator of thermostat. 3. Explain procedure for sweating valve into system.
2. Operation of zone-type hot water makers.	1. Explain operation of aquastats used. 2. Wire hot water maker to aquastat control. 3. Describe piping to hot water maker. 4. Adjust temperature controls on aquastat and HWM.
3. Operation of steam boiler.	1. Properly wire live boiler. 2. Explain electrical connections in wiring. 3. Set water level in boiler. 4. Check operation of low water cut-off. 5. Check operation of limit control. 6. Adjust thermostat.
4. Operation of forced warm air heating system.	1. Properly wire live furnace. 2. Adjust fan on/off settings.

Course Objective	Competencies
	3. Adjust high limit setting. 4. Perform temperature tests.
5. Operation of forced hot water heating system.	1. Properly wire live hot water boiler. 2. Adjust aquastat settings and bleed air from system.
6. Tune-up procedure for oil burner.	1. Replace nozzle. 2. Adjust air handling parts. 3. Install burner into combustion chamber. 4. Perform combustion tests and adjust as needed.
7. Clean heat exchanger surfaces of boiler/furnace.	1. Remove access panels to heat exchanger. 2. Analyze condition of unit. 3. Explain combustion chamber type/condition. 4. Prepare vacuum bag/filters. 5. Select proper brushes. 6. Vacuum unit.
8. Trouble-shooting procedures.	1. Explain symptoms of problem. 2. Follow proper steps in solving problem. 3. Identify repairs as needed. 4. Repair and test system.
9. Commercial burner control systems.	1. Properly wire Honeywell 890F control. 2. Perform scanner signal test. 3. Check safety timing. 4. Check flame failure response timing. 5. Check operation of low voltage control circuit.

Course Objective	Competencies
10. Honeywell 4795/7795 commercial control system.	1. Properly wire control system. 2. Test scanner signal. 3. Test air flow circuit. 4. Check operation of pre-purge timer. 5. Identify amplifier used.
11. Fireye M-Series 2 control system.	1. Identify dip switch settings. 2. Explain recycle feature. 3. Test flame signal strength.
12. Honeywell 4140 control.	1. Explain purpose of run/test switch. 2. Explain purpose of BSMI circuit. 3. Explain operation of motor starter. 4. Explain purpose of low/high fire switches. 5. Properly wire modulation circuit.
13. Honeywell BC 7000/Fireye E 100 controls.	1. Explain basics of microprocessor control. 2. Identify codes displayed by control. 3. Explain purpose of expansion module. 4. Explain flame signal readings. 5. Test infrared control.
14. Alarm circuit.	1. Explain lockout circuit. 2. Explain and test flame failure response time. 3. Properly wire alarm circuit. 4. Explain operation and purpose of alarm silencer.

Course Objective	Competencies
15. Service procedure on fire tube boiler.	1. Remove burner from boiler. 2. Open front and rear doors. 3. Explain operation of 4-pass system. 4. Explain how to clean boiler. 5. Adjust spark ignition system 6. Reassemble boiler.
16. Start-up procedure on boiler.	1. Explain valves to open/close. 2. Explain fuel selection circuit. 3. Start oil pump/gas system. 4. Explain oil/gas pressure settings. 5. Explain burner cycle from pre- through post purge.
17. Boiler water level circuit.	1. Explain operation of low water cut-off. 2. Explain operation of automatic water feeder. 3. Explain service procedure on feeder valve.