COMMON COURSE OUTLINE: Course discipline/number/title: BU 2622: HVAC Control Systems Lab

A. CATALOG DESCRIPTION
   1. Credits: 2
   2. Hours/Week: 4
   3. Prerequisites (if any): Successful completion of BUM II courses or background in electricity and concurrent or successful completion of BU 2632.
   4. Co-requisites (if any): None
   5. MnTC Goals (if any): NA

   This course covers the principles of HVAC controller systems. Various types of computer aided control, electromechanical, electronic, and pneumatic systems will be analyzed and operated with an emphasis put on wiring and troubleshooting of the control circuits. Recommended Entry Skills/Knowledge: Electrical and/or Mechanical Ability.

B. DATE LAST REVISED (use current date): April, 2004

C. OUTLINE OF MAJOR CONTENT AREAS:
   1. Demonstrate lab safety.
   2. Demonstrate HVAC fundamentals.
   3. Demonstrate commercial HVAC systems.
   4. Demonstrate control principles
   5. Write and demonstrate programs for the Andover system.
   6. Diagnose and operate a control system.
   7. Diagnose and operate an electrical control system.
   8. Diagnose and operate an electronic control system.
   9. Diagnose and operate building automation systems and controllers.
   10. Diagnose and operate operator interfaces.
   11. Diagnose and operate pneumatic actuators.
   12. Diagnose and operate pneumatic dampers.
   13. Diagnose and operate pneumatic valves.
   14. Diagnose and operate pneumatic thermostats.
   15. Diagnose and operate pneumatic humidistats.
   16. Diagnose and operate pneumatic pressure switches.
   17. Diagnose and operate pneumatic transmitters.
   18. Diagnose and operate pneumatic receiver controllers
   19. Diagnose and operate pneumatic auxiliary devices.
   20. Diagnose and operate pneumatic control system applications.
   22. Demonstrate circuit troubleshooting.
   23. Diagnose and operate heat/cool control circuits.
   24. Diagnose and operate AC major components.
   25. Diagnose and operate high-pressure controls.
   26. Diagnose and operate contactors.
   27. Diagnose and operate energy management systems.
   28. Diagnose and operate computer control systems.
   29. Install a thermostat/sub base.
   30. Calibrate thermostat.
   31. Adjust blower system.
   32. Amperage checks blower motor.
   33. Service furnace/AC system.
   34. Access Andover energy management system.
   35. Monitor furnace/AC operation.
   36. Print graph of furnace/AC operation.
   37. Measure heat/cooling temperature difference.
   38. Adjust CFM.
C. OUTLINE OF MAJOR CONTENT AREAS: Continued. . .
   40. Measure gas pressure.
   41. Measure thermocouple voltage.
   42. Measure draft.
   43. Wire in relay.
   44. Wire a heat control circuit.
   45. Troubleshoot circuit problems.
   46. Wire a heat/cool circuit.
   47. Troubleshoot test points.
   48. Identify AC electrical components.
   49. Adjust AC controls.

D. LEARNING OUTCOMES (GENERAL): The Student will be able to:
   1. Test.
   2. Analyze.
   3. Repair.
   4. Install.
   5. Operate HVAC Control Systems.

E. LEARNING OUTCOMES (MNTC): NA

F. METHODS FOR EVALUATION OF STUDENT LEARNING:
   1. Fully Operational Lab Tests
   2. Workbook and Lab assignments

G. SPECIAL INFORMATION (if any): None