

**J. Sargeant Reynolds Community College
Course Content Summary**

Course Prefix and Number: ARC 241

Credits: 3

Course Title: Building Mechanical Systems

Course Description: Studies components and design for systems in residential and commercial building. Covers plumbing supply and drainage, including storm drainage and private sewage disposal. Requires calculation of overall heat balances for buildings as basis for design of heating and cooling systems. Prerequisite: ARC 122 or equivalent. Lecture 3 hours per week.

General Course Purpose: Course serves as an introduction to mechanical systems and components that are found in contemporary building construction including HVAC, communication, security devices, plumbing systems, and various impacts on system sizing to include weather, envelope construction (doors, windows, and walls), and various energy options. Course required for the Contemporary Technology for Design and Building Construction Management Specializations of the Architectural and Engineering Technology AAS degree.

Course Prerequisites and Co-requisites:

Prerequisite: ARC 122 or equivalent

Student Learning Outcomes:

Upon completing the course, the student will be able to

- a. Demonstrate heat loss calculations for an entire residence (walls, roof, floor, and infiltration);
- b. Recognize the various types of systems for HVAC design to include geothermal, electric, heat pump, furnace, and chiller (commercial);
- c. Acquire knowledge of water supply and drainage systems;
- d. Gain knowledge of sewage system design;
- e. Understand heating and air-conditioning system planning; and
- f. Gain knowledge of architectural design for temperature and sound control.

Major Topics to Be Included:

- a. Sustainable construction as related to HVAC and plumbing systems
- b. Heat loss calculations
- c. Water supply, design, and drainage and its importance to the environment
- d. Sewage disposal
- e. Heating and air-conditioning systems
- f. Sound control

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