

**Course Description****ACR0044 | HVAC/R Advanced Services Practices | 11.66 credits**

The HVAC/R Advanced Service Practices course offers a comprehensive dive into advanced HVAC/R concepts, focusing on the operation and maintenance of various systems. Students will explore hydronic and chilled systems, understand air properties, and utilize pressure enthalpy charts for refrigerant cycle analysis. Indoor air quality measurement standards are covered, along with an introduction to pneumatic control systems and thermal storage maintenance. The curriculum emphasizes the importance of accurately calculating commercial heating and cooling loads, balancing air distribution systems, selecting energy-efficient equipment, and analyzing building management systems.

**Course Competencies**

**Competency 1:** The student will demonstrate a comprehensive understanding of the operation and maintenance of advanced HVAC/R systems, including hydronic and chilled systems by:

1. Analyzing the operation of hydronic and chilled systems to identify the best practices for efficient maintenance and performance optimization
2. Understanding air properties and their impact on HVAC/R system performance to enhance operational efficiency
3. Applying pressure enthalpy charts effectively for refrigerant cycle analysis to troubleshoot and optimize system performance

**Competency 2:** The student will gain expertise in indoor air quality measurement standards and pneumatic control systems, ensuring optimal environmental conditions in HVAC/R applications by:

1. Measuring and assessing indoor air quality based on established standards to improve occupant health and comfort
2. Implementing pneumatic control systems to regulate HVAC/R operations and enhance system responsiveness and efficiency
3. Analyzing the impact of indoor air quality on overall system performance to recommend improvements and ensure compliance with health standards

**Competency 3:** The student will develop the skills necessary to accurately calculate commercial heating and cooling loads, balance air distribution systems, and select energy-efficient equipment by:

1. Calculating commercial heating and cooling loads using industry-standard methods to ensure system adequacy and performance
2. Balancing air distribution systems to optimize airflow and temperature control across spaces for improved comfort and efficiency
3. Demonstrating energy-efficient equipment based on analysis of system requirements and energy performance metrics to promote sustainability in HVAC/R installations

**Learning Outcomes:**

1. Use quantitative analytical skills to evaluate and process numerical data
2. Solve problems using critical and creative thinking and scientific reasoning
3. Formulate strategies to locate, evaluate, and apply information