Refrigeration & Heating (RH)

Courses

RH A101 Refrigeration and Air Conditioning Fundamentals 4 Credits
Explores compressors, condensers, evaporators, metering devices and related components. Offers instruction in the proper use of tools and testing devices applicable to the refrigeration and air-conditioning trades and experimentation with refrigeration system training devices. Provides instruction and experience on piping layout and assembly. Provides students with practice at swaging, flaring, bending, soldering and brazing. Includes instruction on the design, construction, troubleshooting, service and repair of household refrigerators and freezers.

RH A103 Technical Mathematics for Industrial Trades 3 Credits
Focuses on mathematics as applied to trade and vocational work. Covers fractions, decimals, percentage, powers of numbers, and basic algebraic elements. Also explores geometric concepts, ratios and proportions, scale drawings, and trigonometric functions.

RH A105 Electrical Circuits for Refrigeration and Heating I 3 Credits
Explores the fundamentals of electricity, electrical safety, magnetism and its association with electricity, Ohm's Law, series and parallel circuits, capacitance, inductance, resistance, transformers, and AC-DC motors and power factor. Introduces schematics and wiring diagrams, units of electrical measurement, and the use of meters to analyze circuits.

RH A109 Principles of Thermodynamics 3 Credits
Focuses on physical laws applied to refrigeration and heating. Introduces practical aspects of states of matter, energy forms, pressure, psychrometrics, pressure/enthalpy measurements, load calculations, heat quantities, heat transfer, insulation factors and coefficients, gas laws, and heat and water vapor flow through structures.

Corequisites: RH A103.

RH A122 Refrigeration and Air Conditioning 4 Credits
Introduces and analyzes properties and applications of common refrigerants. Explores mechanical cooling systems for air conditioning and refrigeration and discusses various alternative cooling methods. Emphasizes safe refrigerant handling and preparation for the EPA Section 608 certification exam. Guides students through the process of building functional refrigeration systems in the lab and learning to properly adjust and maintain refrigeration equipment.

Prerequisites: RH A101 and RH A109.

RH A126 Electrical Circuits for Refrigeration and Heating II 3 Credits
Emphasizes how to interpret schematic wiring diagrams and control circuits. Covers conductor sizing and motor protection for single-phase and three-phase motors. Builds understanding of electro-mechanical controls and introduces solid state controls for HVAC/R systems. Lab projects provide opportunities for practical application of course content.

Prerequisites: RH A103 and RH A105.

RH A132 Troubleshooting for HVAC/R Systems 3 Credits
Emphasizes systematic analysis and troubleshooting of HVAC/R systems to include mechanical, piping, electrical, and control systems with heavy emphasis on lab activities and training devices. Uses actual equipment with component faults to strengthen and test troubleshooting skills.

Prerequisites: RH A101 and RH A105 and RH A109.

RH A201 Commercial and Ammonia Refrigeration 4 Credits
Covers commercial refrigeration systems, including ammonia refrigeration, CO2 refrigeration, components unique to commercial and industrial refrigeration, ice makers and ice making equipment, grocery store display cases, compressor racks, defrost methods, lubrication systems and oil return, effects of system contaminants, and pipe sizing. Introduces the safe startup and operation of a liquid overfeed ammonia refrigeration system.

Prerequisites: RH A122 and RH A126.

RH A203 HVAC/R Basic Controls 3 Credits
Introduces concepts and components of basic residential and commercial heating and cooling control applications. Explores primary burner controls for forced air and hydronic control systems. Lab projects give practical application to the knowledge covered in the course.

Prerequisites: RH A126 and RH A132.

RH A209 Codes for HVAC/R 2 Credits
Introduces current mechanical codes as adopted by the State of Alaska and covers sections of the International Mechanical Code related to general heating, ventilation, and air conditioning work.

RH A211 Customer Relations and Job Etiquette 1 Credit
Explores methods, protocols, and techniques for building and maintaining positive relationships with customers. Identifies a variety of characteristics and related behaviors required of a successful and productive HVAC/R technician.

RH A225 Heating Fundamentals and Forced Air Heat 4 Credits
Introduces knowledge and skills needed for the installation and service of forced air heating systems. Covers beginning maintenance and installation to advanced troubleshooting of heating systems.

Prerequisites: RH A109.

RH A226 Commercial HVAC/R Systems 4 Credits
Introduces commercial heating, ventilation, and air conditioning systems by category and application. Includes both air-side and water-side systems, along with humidification, ventilation, and air filtration requirements.

Prerequisites: RH A225.

RH A228 Advanced Hydronic Heat Systems 4 Credits
Explores hydronic heating sources and emitters. Covers residential and light commercial boilers and hydronic heating systems. Includes radiant panel heating, emphasizing wiring and troubleshooting of hydronic controls.

Prerequisites: RH A225.

RH A229 HVAC/R Control Systems 3 Credits
Surveys heating, ventilation, and air conditioning control systems and control theory. Topics will include pneumatic, electronic, and direct digital control (DDC) systems.

Prerequisites: RH A203.
**RH A232 HVAC/R Sheet Metal 3 Credits**

**RH A290 Selected Topics in Refrigeration and Heating 1-3 Credits**
Covers topics in heating, ventilating, air conditioning, and refrigeration (HVAC/R) such as theory, problem solving, system operation, economic analysis, specialized applications, and performance optimization.

*Special Note:* May be repeated up to 6 credits with change of subtitle.