

Refrigeration & Heating (RH)

Courses

RH A101 Refrigeration and Air Conditioning I 4 Credits

Introduces the concepts behind mechanical cooling, including states of matter, heat transfer, and the gas laws. Explores basic refrigeration components, such as compressors, condensers, evaporators, and metering devices. Offers instruction in the proper use of tools and testing devices applicable to the refrigeration and air-conditioning trades. Includes instruction on the design, construction, troubleshooting, 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 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, AC motors, and power factor. Introduces schematics and wiring diagrams, units of electrical measurement, and the use of meters to analyze circuits. Covers conductor sizing and motor protection for single-phase and three-phase motors.

Special Note: Students should be able to apply basic technical math skills.

RH A107 Fundamentals of Heating 4 Credits

Introduces knowledge and skills needed for the installation and service of forced air and hydronic heating systems. Covers maintenance, installation and troubleshooting of oil- and gas-fired furnaces and low-pressure boilers.

RH A109 HVAC/R Codes 1 Credit

Introduces the concept of mechanical building codes. Presents mechanical building codes as adopted by the State of Alaska, covering sections of the International Mechanical Code related to heating, ventilation, air conditioning and refrigeration (HVAC/R).

RH A122 Refrigeration and Air Conditioning II 4 Credits

Introduces and analyzes properties and applications of common refrigerants. Explores mechanical cooling systems for refrigeration/air conditioning. 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 with a minimum grade of C.

RH A124 HVAC/R Distribution Systems 4 Credits

Introduces heating, ventilation and air conditioning systems by category and application. Includes both air-side and water-side systems, along with humidification, ventilation, air filtration, and air duct design and fabrication.

Prerequisites: RH A101 with a minimum grade of C and RH A107 with a minimum grade of C.

RH A126 HVAC/R Control Systems 3 Credits

Builds understanding of electro-mechanical controls and introduces pneumatic and solid-state controls for HVAC/R systems. Introduces concepts and components of residential and commercial heating and cooling control applications. Explores controls for forced air and hydronic control systems. Lab projects provide opportunities for practical application of course content.

Prerequisites: RH A105 with a minimum grade of C.

RH A132 HVAC/R Troubleshooting Essentials 1 Credit

Covers 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 with a minimum grade of C and RH A105 with a minimum grade of C.

Corequisites: RH A122.

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 with a minimum grade of D and RH A126 with a minimum grade of D.

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 with a minimum grade of D and RH A132 with a minimum grade of D.

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 with a minimum grade of D.

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 with a minimum grade of D.

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 with a minimum grade of D.

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 with a minimum grade of D.

RH A232 HVAC/R Sheet Metal 3 Credits

Introduces the fundamentals of air handling. Covers layout, cutting, forming and fabricating of sheet metal. Reviews Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Duct Construction standards.

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.