

# APPLIED INDUSTRIAL TECHNOLOGY (PIPEFITTERS) (ATPF)

---

## ATPF-1015 Heat, Matter, and Energy 2 Credits

A study of heat theory, matter and energy as they relate to the pipefitting service industry. Included are relative definitions, mathematical conversions, and discussion of the laws of thermodynamics and of related topics covering applications to the heating and cooling industry.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

## ATPF-1025 Basic Controls - Electricity 2 Credits

Course covers the application and theory of electricity as it relates to the heating ventilation and air conditioning industry. Also discussed are temperature controls including thermocouples and thermal resistors.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

## ATPF-1035 Refrigeration Motors and Applications 2 Credits

Course discusses different types of motors, motor operation and the applications of motors in the refrigeration industry. Also covered are various motor devices use for overload protection and changing electrical current.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

## ATPF-1045 Motor Controls & Troubleshooting 2 Credits

Basic electric motor course used for servicing refrigeration equipment. Course covers motor components and operation, safety considerations for restarting and servicing motors. Also included is a discussion of various electrical and mechanical problems that may cause motor malfunction.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

## ATPF-1055 Evaporators, Condensers, and Compressors 2 Credits

Course covers the function and purpose of evaporators, condensers and compressors used in the refrigeration industry. Included is a discussion of the respective components and the respective operation with respect to each other and performance in the air cooling process.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

## ATPF-1065 Expansion Devices and Special Components 2 Credits

Course covers expansion devices used in the refrigeration process, specific terminology and the operation of the respective components. In addition, the purpose and operation of expansion devices, including thermostatic and automatic valves, and other special refrigeration enhancing components will be addressed.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

## ATPF-1070 Soldering, Brazing, and Pipefitting Tools 2 Credits

Covers the care and use of hand and power tools that are used in the pipefitting industry. In addition, safe soldering practices, alloys, joint preparation and soldering and brazing operations are included. Emphasis will be placed on the application process where the tools and equipment will be used.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

## ATPF-1085 Refrigeration and Refrigerants 2 Credits

Introduction to the refrigeration process including relationships between pressure and boiling points and vaporization and cooling coils. Also covers refrigeration cycles, plotting and interpretation of pressure/enthalpy charts.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

## ATPF-1095 Systems Charging 2 Credits

Course covers the charging of refrigerants in vapor and liquid states into air conditioning and heat pump systems and refrigerant oil with systems applications. Also included are the identification and operation of precision instrument for calibrating procedure.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

## ATPF-1125 System Evacuation 2 Credits

Basic course covering the evacuation procedures followed in initiating refrigeration equipment and systems. Also included are tool and equipment identification and use, proper selection and application of each.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

## ATPF-1135 Refrigeration Applications and Ice Machines 2 Credits

Refrigeration course discussing various refrigeration types and conditions for proper application. Also included are defrost methods for walk-in equipment, ice machines operation and product harvest and equipment service procedures.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-1145 Refrigeration Transport and Problem Solving**  
**2 Credits**

Advanced course describing the refrigeration processes employed in the transportation of frozen and perishable goods using various vehicles of transport. Included are typical operating conditions for commercial refrigeration and troubleshooting common problems.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-1210 Rigging**  
**2 Credits**

A study of different materials used in the rigging process. Recognize a variety of knots and exhibit an ability to tie them. Includes crane operation and many alternate methods of determining load weights.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-1220 Basic Pipefitting Layout**  
**1 Credit**

A study of basic layout for pipefitters and technicians in the construction industry. Covers calculations involved in designing, installing and repairing piping runs. Reviews basic mathematics for preparation to succeed in problem solving found on the job.

*Lecture: 1 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-1230 Plate Fillet Weld**  
**1 Credit**

Basic pipefitter welding course covering the practicalities of fillet welded joints including types, features and weld size specification. Also included are shop techniques and set up procedures for proper welds.

*Lecture: 1 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-1260 Sprinkler Layout**  
**1 Credit**

A study of layout for the sprinklerfitter and technicians in the construction industry. Covers calculations involved in designing, installing and repairing sprinkler piping runs. Review in basic mathematics for preparation of problem solving on the job.

*Lecture: 1 hours*

*Prerequisite(s): Departmental approval: Admission to Pipefitter's apprenticeship program.*

**ATPF-1270 Sprinkler Drawings**  
**4 Credits**

A study of sprinkler systems and techniques used to produce sprinkler drawings used by pipefitters in the construction industry. In addition, interpretation of fire suppression drawings and relative piping will be thoroughly addressed.

*Lecture: 4 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-1360 Hydronic Heating and Cooling**  
**2 Credits**

A study of hydronic heating and cooling systems used by pipefitters and service technicians in the construction industry. Course includes a discussion of various systems, equipment sizing, air control and installation techniques. Course includes a discussion of various systems, equipment sizing, air control and installation techniques and factors that affect chilled water equipment.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-1804 Special Topics: Plate Fillet Weld**  
**1 Credit**

Basic pipefitter welding course covering the practicalities of fillet welded joints including types, features and weld size specification. Also included are shop techniques and set up procedures for proper welds.

*Lecture: 1 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-1806 Special Topics: Cooling Towers and Troubleshooting**  
**2 Credits**

Course explains cooling tower function and the different types of cooling towers. It discusses flow patterns, the tower sump, makeup water, blowdown and balancing the water flow. Pumps used in cooling towers will also be discussed. This course also explains the startup procedures, operation and maintenance of chilled water equipment including air-cooled, water-cooled and absorption chillers.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-1807 Special Topics: Chilled Water Systems**  
**2 Credits**

Course covers compression cycle and absorption chillers used in the refrigeration process, specific terminology and the operation of the respective components. In addition, the purpose and operation of reciprocating, scroll, rotary screw and centrifugal compressors are included. Also presented are direct expansion and flooded evaporators, water and air cooled condensers, thermostatic expansion valves metering devices and purge units.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to apprenticeship program.*

**ATPF-1808 Special Topics: Pipe Groove Weld**  
**2 Credits**

Basic pipefitter welding course covering open root welding including joint design, material selection and preparation, and the welding process. Included in this course are technique demonstration and application with respect to root gap, land and fit up in compliance with industry standards.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to pipefitter's apprenticeship program.*

**ATPF-1809 Special Topics: P/F Pipe Bead Weld  
2 Credits**

Basic pipe bead welding course covering purpose, material selection, preparation, and the welding process as described by the National Certified Pipe Welding Bureau NCPWB. In addition, proper pipe bead welding techniques will be demonstrated and practiced.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: Admission to program.*

**ATPF-1810 Special Topics: P/F Plate Group Weld  
2 Credits**

Course covers the purpose and processes of plate groove welding including proper joint design and specifications. Included are welding applications and techniques required for proper material preparation, welding machine set up and welding operations.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: Admission to Pipefitter's Apprenticeship program.*

**ATPF-2115 Electric Heat  
1 Credit**

Introductory course covering electric heat devices including hydronic boilers and controls that regulate equipment operation and safety. Included are service technician repair and preventative maintenance guidelines.

*Lecture: 1 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2125 Gas Heat  
2 Credits**

Course covers gas furnaces, operation and controls, including safety features of gas heat. Troubleshooting and customer service is also demonstrated and discussed.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2130 Oil and Hydronics  
2 Credits**

Course discusses the types operation of oil and hydronic furnaces including the atomization of fossil fuels and water systems used for the ignition and circulation process. Maintenance procedures for service of the respective systems including oil burning efficiency and damping effects.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2145 Air Distribution and Psychrometrics  
2 Credits**

Course covers air quality, psychrometric and air distribution of heat systems with respect to the pipefitting industry. Properties of air and air pollutants, heat recovery and purification will also be discussed.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2155 Air Conditioning Installation and Controls  
2 Credits**

Course covers different types of air conditioning systems and related controls. In addition, installation and system balancing and troubleshooting mechanical problems are addressed.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's Apprenticeship program.*

**ATPF-2165 All Weather Systems  
2 Credits**

Basic refrigeration course covering the concepts and operation of year round air conditioning systems including reverse cycle refrigeration and heat pumps. In addition, open and closed pump systems and effects on water quality will be covered.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2175 Domestic Refrigeration  
2 Credits**

Covers the refrigeration cycle and process of domestic refrigeration including component function and defrost procedures. Also included are trouble shooting and maintenance procedures and related safety hazards.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to pipefitter's apprenticeship program.*

**ATPF-2340 Steam Systems  
2 Credits**

Instructional course describing the proper installation, service and repair of steam piping systems in various commercial and industrial situations.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2450 Oxy/Acetylene Cutting and Basic Welding I  
2 Credits**

Introductory course describes oxyacetylene cutting and basic shielded metal arc welding (SMAW). Included are safety practices to be followed and techniques required to cut common material in the pipefitting industry.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2470 Oxy/Acetylene Cutting and Basic Welding II  
2 Credits**

Review of Oxyacetylene cutting and basic welding and includes applied math concepts required for determining various fabrication angles using shielded metal arc welding (SMAW). Terminology and specific rod selection used in plate and pipe welding processes will also be covered.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2490 Pipefitters Welding III**

**2 Credits**

Course covers the welding standards as prescribed by American Society of Mechanical Engineers and discusses weld quality, appearance and tolerances for acceptance. Included will be an introduction to template making and welding exercises designed to develop techniques for welding elbows and angles.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2510 Sprinkler Fire Protection**

**2 Credits**

Instructional course describing the proper installation, service and maintenance of sprinkler fire protection systems.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2520 Valve Repair**

**2 Credits**

Course describing the proper installation, service and repair of valves in various commercial, industrial and residential situations. Also included proper selection of valves for each situation.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2805 ST: Sheet MEtal D.9.1**

**1 Credit**

Certification course covering the procedures required by the American Welding Society and in conjunction with testing parameters as prescribed by the Welding Procedures Specifications for completing the sheet metal workers welding test. Course includes a complete review of metal inert gas (MIG) welding and a comprehensive study of the certification process.

*Lecture: 1 hours*

*Prerequisite(s): Departmental approval: admission to Sheet Metal Worker's Apprenticeship program.*

**ATPF-2807 Special Topics: Fixed Vertical 5G Pipe Fitter Weld**

**2 Credits**

Basic pipefitter welding course covering open root welding including joint design, material selection and prep and the welding process. Included in this course are technique demonstration and application with respect to root gap, land and fit up in compliance with industry standards.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to program.*

**ATPF-2808 Special Topics: Fixed 45 Degree 6G Pipe Fitter Weld**

**2 Credits**

Basic pipefitter welding course covering open root welding including joint design, material selection and prep and the welding process. Included in this course are technique demonstration and application. The 6G position is for weld test compliance.

*Lecture: 2 hours*

*Prerequisite(s): Departmental Approval: admission to Pipefitter's Apprenticeship program.*

**ATPF-2812 Special Topics: P/F Fixed Horizontal 2G Pipe Weld**

**2 Credits**

Basic pipefitter welding course covering open root welding including joint design, material selection and prep and the welding process. Included in this course are technique demonstration and application with respect to root gap, land and fit up in compliance with industry standards

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2813 Special Topics in Advanced Automatic Controls**

**2 Credits**

Course covers the different types of temperature controls for the refrigeration industry and the equipment used to troubleshoot electronic failure. In addition, heat-cool electrical sequences, control circuits and loops will be covered.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*

**ATPF-2814 ST: U/A 21 Welding**

**3 Credits**

United Association (UA) welding certification course covering test procedures and certification opportunities for highly skilled pipe fitter welders. Included are guidelines as prescribed by the American Petroleum Institute API and the American Society of Mechanical Engineers ASME for processed piping. Successful completion of the course requires passing weld test in accordance with API, ASME and U/A standards.

*Lecture: 3 hours*

*Prerequisite(s): Departmental approval: admission to Pipefitter's apprenticeship program.*