

APPT 130: REVIEW & TURNOUT

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2021
Units:	3.5
Hours:	36 lecture, 18 laboratory per quarter (54 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing/Steamfitting & Pipefitting/Air Conditioning Refrigeration Technology Apprenticeship Program.
Advisory:	Not open to students with credit in APPR 130.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- A student will be able to define Enthalpy.
- A student will be able to demonstrate proper soldering and brazing technique for copper tube.
- A student will be able to demonstrate ability to troubleshoot defective HVAC components.

Description

A comprehensive overview of the entire plumbing, steamfitting, and refrigeration courses of instruction and preparation for completion examinations. Presentation of the latest current code and safety information. Planning and performing hands-on piping projects. Perform hands-on troubleshooting projects for air conditioning systems.

Course Objectives

The student will be able to:

- Relate the current code and safety regulations to the Pipe Trades Industry.
- Plan, organize and implement a piping project.
- Perform hands-on troubleshooting projects for air conditioning systems.
- Pass the final examinations to turn out as a journeyman plumber, steamfitter or refrigeration/air conditioning mechanic.

Course Content

- Relate the current code and safety regulations to the Pipe Trades Industry
 - Uniform Plumbing Code
 - OSHA safety regulations
- Plan, organize and implement a piping project

- Draw piping project
 - Material requisitions
 - Manipulative piping projects
 - Rigging review
- C. Perform hands-on troubleshooting projects for air conditioning systems
- Review refrigeration and air conditioning controls
 - Review pneumatic and electronic controls
 - Draw wiring diagrams
 - Troubleshooting electrical control circuits
- D. Pass the final examinations to turn out as a journeyman plumber, steamfitter or refrigeration/air conditioning mechanic
- Plumbing final exams
 - Steamfitter final exams
 - Refrigeration and air conditioning final exams

Lab Content

Students will work individually and in teams on piping projects and control circuit troubleshooting projects.

Special Facilities and/or Equipment

- Personal protective equipment.
- Laboratory with piping equipment, tools and measuring instruments.

Method(s) of Evaluation

Results of written exercises and final examination
Satisfactory completion of hands-on projects
Maintenance of a student's workbook with questions drawn from text
Group and classroom participation

Method(s) of Instruction

Lecture
Lab Assignment
Group Discussion
Demonstration

Representative Text(s) and Other Materials

The following is a comprehensive list of textbooks that may be used to support this course. The student will use only those books assigned to their particular trade/program.

- International Pipe Trades Joint Training Committee. Standard for Excellence. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, 2015.
- International Pipe Trades Joint Training Committee. UA Pipe Fittings, Valves, Supports and Fasteners. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, 2015.
- Ripka, L.V. Plumbing Design and Installation. 4th ed. with workbook. Orland Park, IL: American Technical Publishers, Inc., 2012.
- International Pipe Trades Joint Training Committee, Inc. Soldering and Brazing. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc, 2015.
- International Association of Plumbing and Mechanical Officials. 2016 California Plumbing Code California Code of Regulations Title 24, Part 5. Ontario, CA: International Association of Plumbing and Mechanical Officials, 2016.
- International Pipe Trades Joint Training Committee, Inc. Drainage Systems. Orland Park, IL: American Technical Publishers, 2016.

- International Pipe Trades Joint Training Committee, Inc. Gas Installations. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc., 2016.
- International Pipe Trades Joint Training Committee, Inc. Related Science. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc., 2014.
- International Pipe Trades Joint Training Committee, Inc. Related Math. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc., 2016.
- International Pipe Trades Joint Training Committee, Inc. Water Supply. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc., 2004.
- International Pipe Trades Joint Training Committee, Inc. Drawing Interpretation and Plan Reading. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc., 2015.
- International Association of Plumbing and Mechanical Officials. Uniform Plumbing Code. Ontario, CA: International Association of Plumbing and Mechanical Officials, Inc., 2015.
- CAL/OSHA Pocket Guide For The Construction Industry. 2015.
- CAL/OSHA. State of California Construction & Electrical Safety Orders. Davenport, IA: MANCOMM, 2016.
- Mancomm, Inc. 29 CFR - 1926 OSHA Construction Industry Regulations & Standards. Davenport, IA: MANCOMM, 2017.
- De Mark, Larry. Signal Person Training Course Version 4 with Student Guide. Stratford, NJ: Equipment & Training Solutions, LLC, 2012.
- American Technical Publishers. Plumbing Service, Maintenance, and Repair. Orland Park, IL: International Pipe Trades Joint Training Committee, 2017.
- International Association of Plumbing and Mechanical Officials. Uniform Plumbing Code Study Guide. Ontario, CA: International Association of Plumbing and Mechanical Officials, Inc., 2015.
- International Pipe Trades Joint Training Committee. United Association Piping Handbook and Offset Formulas. Upper Marlboro, MD: United Association, 2000.
- International Pipe Trades Joint Training Committee. United Association Pocket Reference Chart. Upper Marlboro, MD: United Association, 2008.
- Smith, Lee. Mathematics for Plumbers and Pipefitters. 8th ed. Clifton Park, NY: Delmar Cengage Learning, 2013.
- International Pipe Trades Joint Training Committee. Oxy-Fuel Practices. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, 2016.
- International Pipe Trades Joint Training Committee. Welding Practices & Procedures for the Pipe Trades. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, 2016.
- KORE-TECKX, Inc. The Pipe Fitters Field Book. Alberta, Canada: Kore-teckx, Inc., 2015.
- Proctor, Thomas E., and Leonard P. Toenjes. PRINTREADING for Residential and Light Commercial Construction Part 2. 6th ed. Orland Park, IL: American Technical Publishers, Inc., 2016.
- South Bay Piping Industry Labor/Management Trust. TGO-Toxic Gas Ordinance Data Book. 2017.
- National Fire Protection Association. NEPA 99 Health Care Facilities Code. 2015 ed. Quincy, MA: National Fire Protection Association, 2014.
- International Pipe Trades Joint Training Committee, Inc. AutoCAD/ AutoCAD LT 2013 Level 1. Marlboro, MD: International Pipe Trades Joint Training Committee, Inc., 2013.
- Jeffus, Larry. Welding Principles and Applications. 7th ed. Clifton Park, NY: Delmar Cengage Learning, 2012.
- American Technical Publishers. Building Automation Control Devices and Applications. Orland Park, IA: American Technical Publishers, 2008.
- International Pipe Trades Joint Training Committee, Inc. UA Foreman Training Manual. Washington, DC: International Pipe Trades Joint Training Committee, Inc., 2008.
- USC, Foundation of Cross Connection Control. Manual of Cross Connection Control. 10th ed. Los Angeles, CA: Foundation of Cross Connection Control, 2014.
- International Pipe Trades Joint Training Committee, Inc. Rigging. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc., 2014.
- Frankland, Thomas W. Pipe Template Layout. New York, NY: Glencoe McGraw Hill, The Bruce Publishing Company, 2008.
- Frankland, Thomas W. The Pipefitters and Pipe Welder's Handbook. New York, NY: Glencoe McGraw Hill, 2008.
- Frankland, Thomas W. Pipe Trades Pocket Manual. New York, NY: Glencoe McGraw Hill, 2008.
- Carrier Corporation. General Training Electricity (Fundamentals) GTE-II. Modules 1-3. Syracuse, NY: Carrier Corporation, 1993.
- International Pipe Trades Joint Training Committee. United Association Pocket Reference Chart. Upper Marlboro, MD: United Association, 2008.
- International Pipe Trades Joint Training Committee, Inc. Steam Systems. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc., 2015.
- Spirax Sarco. Design of Fluid Systems, Hook-ups. Spirax Sarco, 2012.
- Spirax Sarco. Design of Fluid Systems, Steam Utilization. Spirax Sarco, 2006.
- International Pipe Trades Joint Training Committee, Inc. Hydronic Heating and Cooling for United Association Journeyworkers & Apprentices. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc., 2015.
- Garby, Ronald G. ITP's Crane & Rigging Handbook. Alberta, Canada: IPT Publishing and Training LTD., 2015.
- Mechanical Service Contractors Association. MSCA Customer Service Training Series. Rockville, MD: Mechanical Service Contractors of America, 2009.
- Auvil, Ronnie J. HVAC and Mechanical Systems Training Manual. Orland Park, IL: American Technical Publishers, 2014.
- Carrier Corporation. General Training Electricity (Fundamentals) GTE-II. Modules 1-9. Syracuse, NY: Carrier Corporation, 1993.
- Carrier Corporation. General Training Air Conditioning (Fundamentals) GTAC-I. Modules 1-4. Syracuse, NY: Carrier Corporation, 1993.
- The International Pipe Trades Joint Training Committee. Basic Electricity. Orland Park, IL: American Technical Publishers, Inc., 2015.
- International Pipe Trades Joint Training Committee. Refrigeration Mechanical Equipment Service Manual. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc., 2014.
- International Pipe Trades Joint Training Committee. Refrigerant Controls. Orland Park, IL: American Technical Publishers, Inc., 2015.
- Smith, Russell E. Electricity for Refrigeration, Heating and Air Conditioning. 9th ed. Stamford, CT: Cengage Learning, 2015.
- Smith, Russell E. Lab Manual: Electricity for Refrigeration, Heating and Air Conditioning. 9th ed. Stamford, CT: Cengage Learning, 2015.
- Auvil, Ronnie J. HVAC and Refrigeration Systems Training Manual. Orland Park, IL: American Technical Publishers, 2014.
- International Pipe Trades Joint Training Committee, Inc. Pneumatic Controls. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc., 2016.
- Auvil, Ronnie J. HVAC Control Systems. 3rd ed. American Technical Publishers, Inc., 2013.
- Auvil, Ronnie J. HVAC Control Systems: Work Book. 3rd ed. American Technical Publishers, Inc., 2013.

Riesberg, Marty, Terry Coleman, and Jim Simpson. Building Automation: Control Devices and Applications. Orland Park, IL: American Technical Publishers, 2008.

The International Pipe Trades Joint Training Committee. Pumps. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, 2015.
Pearson. Commercial HVACR Equipment Lab Manual. Boston, MA: Pearson Learning Solutions, 2014.

International Pipe Trades Joint Training Committee. Hydronic Heating and Cooling. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, 2016.

Cleaver Brooks. Boiler Room Guide. Thomasville, GA: Cleaver Brooks, 2016.

Trane. Air Conditioning Clinic Centrifugal Water Chillers. Davidson, NC: Trane, 2012.

Trane. Air Conditioning Clinic Absorption Water Chillers. Davidson, NC: Trane, 2012.

Trane. Air Conditioning Clinic Chilled Water Systems. Davidson, NC: Trane, 2012.

Trane. Air Conditioning Clinic Helical Rotary Water Chillers. Davidson, NC: Trane, 2012.

Trane. Air Conditioning Clinic Ice Storage Systems. Davidson, NC: Trane, 2012.

Steingress, Frederick M., and Daryl R. Walker. Low Pressure Boilers. 4th ed. Orland Park, IL: American Technical Publishers, 2013.

Steingress, Frederick M., and Daryl R. Walker. Low Pressure Boilers Study Guide. 4th ed. Orland Park, IL: American Technical Publishers, 2013.

Steingress, Frederick M., Harold J. Frost, and Daryl R. Walker. High Pressure Boilers. 5th ed. Orland Park, IL: American Technical Publishers, 2012.

Steingress, Frederick M., Harold J. Frost, and Daryl R. Walker. High Pressure Boilers Study Guide. 5th ed. Orland Park, IL: American Technical Publishers, 2012.

National Fire Protection Association. NFPA 70E Standard for Electrical Safety in the Workplace. 2015 ed. Quincy, MA: National Fire Protection Association, 2014.

eHazard Management, LLC. Low Voltage Qualified Electrical Workplace Safety. Louisville, KY: eHazard Management, LLC., 2015.

International Pipe Trades Joint Training Committee. Start, Test & Balance. Upper Marlboro, MD: International Pipe Trades Training Committee Inc., 2014.

Trane. Psychometric Charts. Davidson, NC: Trane.

Trane. Ductulator I-P and SI Units. Davidson, NC: Trane.

ITT Bell & Gossett. System Syzer Calculator. Morton Grove, IL: ITT Bell & Gossett.

Note: Although one or more of these texts are older than the recommended 5 years they conform to national training standards and are considered seminal works in the discipline. We will adopt the next edition of each text, as it is published.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

A. Readings from assigned textbooks:

1. HVAC Control Systems: Chapter 13, study question exercises, electrical control systems

2. Steam Systems: Chapter 9, Unit 3 workbook lessons, steam piping

B. Writing assignments given in the laboratory

1. Make a schematic drawing of a basic refrigeration control system with components

2. Quizzes from Steam Systems workbook lessons

Discipline(s)

Plumbing