

INSTRUMENTATION AND CONTROL TECHNICIAN APPRENTICESHIP COURSE SUMMARIES

COURSE ISA3400: TOOLS & EQUIPMENT

Students learn to use basic hand and power tools and production skills to safely complete various instrumentation jobs.

Prerequisite: ISA3900: Apprenticeship Safety

COURSE ISA3405: TUBE PRACTICE

Students are introduced to both the theory and the practice of the geometry and mathematics of pipe bending associated with instrumentation installations.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment

COURSE ISA3410: PIPE PRACTICE

Students are introduced to both the theory and the practice of the geometry and mathematics of pipe threading, pipe joining and electric and electrical connections associated with instrumentation installations.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment

COURSE ISA3415: ELECTRICAL THEORY

Students develop an understanding of the basic parameters of an electrical circuit in order to understand why there are different sizes of wires, different ratings of circuit breakers and different types of insulation. Students also learn to identify resistors and understand the purpose of resistors and to interpret their ratings.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment

COURSE ISA3420: RESISTIVE CIRCUITS

Students examine electrical circuits and their properties or voltage, current and resistance using Ohm's law and Kirchhoff's current and voltage laws.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment, ISA3415: Electrical Theory

COURSE ISA3425: POWER & EFFICIENCY

Students study the mathematical relationships that exist between the electrical properties of simple circuits and power and learn the construction, operation and application of different types of storage batteries. Students also explore the basic nature of magnetism.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment, ISA3415: Electrical Theory

COURSE ISA3430: INDUCTANCE & CAPACITANCE

Students are introduced to the factors that affect impedance in an alternating current (AC) circuit as well as the effects of a coil and capacitor on the circuit.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment, ISA3415: Electrical Theory

COURSE ISA3435: HAZARDS & REGULATIONS

Students are introduced to the regulations, codes and potential hazards associated with work in the instrumentation and control technician trade.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment

COURSE ISA3440: PRESSURE MEASUREMENT

Students are introduced to the physics of pressure, the pressure standards used in instrumentation and pressure scales.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment

COURSE ISA3445: CALIBRATION

Students will understand the construction of the components of pneumatic instruments, the function of components and how pneumatic instruments are used in various instrumentation systems. Students are introduced to the knowledge and skills necessary to install and calibrate pneumatic instruments.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment

COURSE ISA3450: CONTROL ELEMENTS

Students are introduced to control valves and how they can be used to control conditions such as flow, pressure, temperature and liquid level by being opened or closed automatically by electronic, hydraulic or pneumatic actuators.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment

COURSE ISA3455: CONTROL VALVES

Students are introduced to the main parts of control valves and how to properly select, install and maintain control valves.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment

COURSE ISA3460: APPLIED MATH

Students solve problems with fractions, ratios, proportions, percentages and percentage changes using the system international (SI) and the imperial system and also demonstrate the ability to convert between the two systems.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment

COURSE ISA3465: APPLIED PHYSICS

Students solve problems related to fluids and the flow of fluids; temperature; and the principles of heat and heat transfer, ideal gases and solids.

Prerequisites: ISA3900: Apprenticeship Safety, ISA3400: Tools & Equipment, ISA3460: Applied Math

COURSE ISA3470: ISA PRACTICUM A

Students, on the work site, continue to develop and refine those competencies developed in related career and technology studies (CTS) occupational areas, previous practicums and other experiences.

Prerequisite: None

COURSE ISA3475: ISA PRACTICUM B

Students, on the work site, continue to develop and refine those competencies developed in related career and technology studies (CTS) occupational areas, previous practicums and other experiences.

Prerequisite: None

COURSE ISA3480: ISA PRACTICUM C

Students, on the work site, continue to develop and refine those competencies developed in related career and technology studies (CTS) occupational areas, previous practicums and other experiences.

Prerequisite: None

COURSE ISA3485: ISA PRACTICUM D

Students, on the work site, continue to develop and refine those competencies developed in related career and technology studies (CTS) occupational areas, previous practicums and other experiences.

Prerequisite: None

COURSE ISA3900: APPRENTICESHIP SAFETY

Students develop knowledge, skills and attitudes in the practice of workshop health and safety, communication and career planning.

Prerequisite: None