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"Where questions become knowledge"

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"Where Questions Become Knowledge"

Fundamentals of Processing Operations - Operator Qualification

Library

Course Code

Course Name

Description and Length (in minutes)

3-18-24

Fundamentals of Processing

Industrial Process Fundamentals	211COST	How Process Operators Can Reduce Costs	How Process Operators Can Reduce Costs looks at how to reduce costs by reducing time, material, and labor wastes and cost reduction in fuel, steam, and utility waste, heat conservation, leaking safety relief valves, and preventive maintenance. (50 min)
Industrial Process Fundamentals	212TESTS	Process Control Tests - Part 1	Process Control Tests - Part 1 examines proper sampling methods for process control tests, reporting and interpreting test results, and common tests to determine physical properties. (30 min)
Industrial Process Fundamentals	213TESTS	Process Control Tests - Part 2	Process Control Tests - Part 2 examines sample purity, production composition, quality, and composition testing methods. (20 min)

Industrial Process Fundamentals	214FIRE	Plant Firefighting: Fuels and Combustion	Plant Firefighting: Fuels and Combustion examine the operator's role in fighting plant fires, fire classifications, burning and extinguishing characteristics, boiling point and vapor pressure, and sources of oxygen, ignition, explosions, and detonations. (45 min)
Industrial Process Fundamentals	215FIRE	Plant Firefighting: Use of Water	Plant Firefighting: The use of water addresses the effect of water on different types of fires, as well as proper hose handling, monitors, sprays, and tools for an effective water stream. (45 min)
Industrial Process Fundamentals	216FIRE	Plant Firefighting: Extinguishers and Foam	Plant Firefighting: Extinguishers and Foam examine fire extinguishers' effectiveness and when to use each type of fire extinguisher. (45 min)
Industrial Process Fundamentals	217FIRE	Plant Firefighting: Tactics and Strategy	Plant Firefighting: Tactics and Strategy explains how to handle different hoses, nozzles, types of fires, and how to approach a fire. (45 min)
Industrial Process Fundamentals	218HEAT	Heat: Temperature and Heat	Heat: Temperature and Heat examine the states of matter, how heat energy works, and the use of boilers and cooling towers. (45 min)
Industrial Process Fundamentals	219HEAT	Heat: Heat Transfer	Heat: Heat transfer addresses types of heat transfer, heat transfer rate calculations, ways heat is transferred in a furnace, efficiency is maximized, and identification types and parts of exchangers. (50 min)
Industrial Process Fundamentals	220HEAT	Heat: Combustion and Fuel	Heat: Combustion and Fuel examines the components of a basic chemical reaction, combustion reaction, and control. (40 min)
Industrial Process Fundamentals	221FLUID	Fluid Mechanics: The Nature of Fluids	Fluid Mechanics: The Nature of Fluids defines fluids, lists the states of matter, and identifies the types of phase changes. (25 min)

Industrial Process Fundamentals	222FLUID	Fluid Mechanics: Units of Measurement	Fluid Mechanics: Units of Measurement addresses density, specific gravity, viscosity, and units of measurement for pressure and temperature. (20 min)
Industrial Process Fundamentals	223FLUID	Fluid Mechanics: The Behavior of Gases	Fluid Mechanics: The Behavior of Gases examines gas laws, gas measurement and handling, and real and ideal gases. (35 min)
Industrial Process Fundamentals	224FLUIDS	Fluid Mechanics - Statics	Fluid Mechanics: Fluid Statics examines static pressure, fluid pressure, specific gravity, and formulas for net positive suction head and calculates static pressure and liquid head from measurements. (45 min)
Industrial Process Fundamentals	225FLUIDS	Fluid Mechanics - Motion of Fluids	Fluid Mechanics: Motion of Fluids explores types of flow, how flow is measured and controlled, and how flowing liquid is affected by gravity, piping, valves, pumps, compressors, fans, and blowers. (45 min)
Industrial Process Fundamentals	226CENTR	Centrifugal Pumps	Centrifugal Pumps addresses the types of centrifugal pumps, pump operation, and pump systems. (65 min)
Industrial Process Fundamentals	227PUMP	Positive Displacement Pumps - Part 1	Positive Displacement Pumps - Part 1 addresses pumps' function, capacity, pressure, and mechanical efficiency. (45 min)
Industrial Process Fundamentals	228PUMP	Positive Displacement Pumps - Part 2	Positive Displacement Pumps - Part 2 explains the parts of a pump and how they function, the proper ways to prepare, start, and shut down a pump, and how to prevent and correct common pump problems. (60 min)
Industrial Process Fundamentals	229INSTR	Process Control Instruments	Process Control Instruments explains the types of valves and how they open and close, as well as other types of process controls and safety devices used to shut down or repair areas in a plant. (50 min)

Industrial Process Fundamentals	231FURN	Furnaces: Combustion and Air Control	Furnaces: Combustion and Air Control describes the parts of a furnace, how it operates, and how to control combustion and maintain an optimal supply of air to the furnace. (40 min)
Industrial Process Fundamentals	232FURN	Furnaces: Startup and Shutdown	Furnaces: Startup and Shutdown examines proper startup and shutdown procedures for furnaces, the appropriate time for shutdown, and how to restore a furnace's correct and efficient firing. (40 min)
Industrial Process Fundamentals	233DISTL	Distillation: Hydrocarbons	Distillation: Hydrocarbons define atoms, molecules, and hydrocarbons, explain fractionation, and how to calculate BTUs. (55 min)
Industrial Process Fundamentals	234DISTL	Distillation: Fractionating Equipment	Distillation: Fractionating Equipment examines fractionating towers and trays, how to safely clean and enter a tower, and proper shutdown and startup procedures. (60 min)
Industrial Process Fundamentals	235DISTL	Distillation: Normal Operations	Distillation: Normal Operations explains what happens in a fractionating tower and how to collect and analyze data properly. (35 min)
Industrial Process Fundamentals	236ACT	Accident Control Techniques	Accident Control Techniques address accident causes and avoidance, PPE, and potentially hazardous areas or situations. (50 min)
Industrial Process Fundamentals	237COMPR	Compression in Industry - Part 1	Compression in Industry - Part 1 explains how to calculate pressure and discusses heat, kinetic and thermal energy, temperature conversions, and thermocouples. (35 min)
Industrial Process Fundamentals	238COMPR	Compression in Industry - Part 2	Compression in Industry - Part 2 examines temperature and volume, Charles'™ Law, Boyle's Law, compressors, and ways to measure work. (35 min)

Industrial Process Fundamentals	380MATH	Basic Plant Mathematics	Basic Plant Mathematics explains adding, subtracting, multiplying, and dividing fractions and decimals, defines direct and inverse proportions, and number conversion. (60 min)
Industrial Process Fundamentals	611MOTOR	AC Motors	AC Motors examines the types of motors, including their functions and uses. (50 min)
Process Operations			
Process Operation	612DIST	Distillation Basics	Distillation Basics presents a basic description of batch and continuous distillation. The course also covers tray-column components. (60 min)
Process Operations	613DIST	Operating Distillation Towers	Operating Distillation Towers covers various distillation tower variables monitored and controlled by the operator. Additionally, the course identifies distillation process upsets, symptoms, and solutions. (30 min)
Process Operations	617PID	Reading P&IDs and PFDs	Reading P&IDs and PFDs explains how to read P&IDs and PFDs, identify the differences between the two, and identify the basic symbols used. (40 min)
Process Operations	618PUMPS	Centrifugal Pump Basics	Centrifugal Pump Basics examines single-stage, end-suction centrifugal pumps and their functions, key components, packing and seals, performance, and pump control. (55 min)
Process Operations	619PUMPS	Centrifugal Pumps: Installation, Troubleshooting and Safety	Centrifugal Pumps Installation, Troubleshooting, and Safety examine centrifugal pump installation procedures, historical and analytical troubleshooting, and pump safety. (45 min)
Process Operations	620HEATX	Heat Exchangers	Heat Exchangers discusses the principles and methods of heat transfer, the common types of heat exchangers, and general inspection and maintenance. This course also covers heat exchanger hazard awareness and safety. (40 min)

Process Operations	621VALVS	Valves	Valves explain the main purpose of valves, overall design features, simple adjustments and lubrication, types of valves and their application, and valve automation. (35 min)
Process Operations	622COOLT	Introduction to Cooling Towers	Introduction to Cooling Towers gives the learner an overview of the four types of wet cooling towers, how they work, and their parts and systems. (40 min)
Process Operations	623COOLT	Operating and Troubleshooting Cooling Towers	Operating and Troubleshooting Cooling Towers gives a breakdown of each process within a cooling tower, how to control cooling tower systems, and how to troubleshoot and fix a system when it breaks. (35 min)
Process Operations	624RCOMP	Reciprocating Compressors	Reciprocating Compressors discusses the major components of reciprocating compressors, including auxiliary equipment, process control, startup, shutdown, and troubleshooting. (30 min)
Process Operations	625PCHEM	Process Chemistry Basics	Process Chemistry Basics examines the building blocks of process chemistry, including atoms, subatomic particles, and elements. (20 min)
Process Operations	626PCHEM	Process Chemistry: Chemical Combinations and Properties	Process Chemistry: Chemical Combinations and Properties explains the basics of chemistry, including chemical properties, chemical formulas and mixtures, chemical bonds and reactions, and pH values. (35 min)
Process Operations	627PCHEM	Process Chemistry: Organic Compounds	Organic Compounds describe and illustrate the functional groups that make up organic compounds and explain how hydrocarbons form. (30 min)
Process Operations	629TRUCK	Cargo Trucks	Cargo Trucks discusses loading and unloading hazardous material onto cargo and cargo tank trucks for transport. This course covers basic hazard communication, shipping papers, packaging, handling, and security. (25 min)

Process Operations	631TANK	Tank Cars	Tank Cars explain loading or unloading tank cars and the requirements for documentation, inspections, and hazardous material handling. (40 min)
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