

# Process Operations Technology Program

This program is designed for individuals seeking a career as a Process Operator Technician. Participants will learn the theories behind various chemical plant processes, green technologies and gain hands-on experience in these areas.

This fast-track training program is 15-20 weeks. The course fee is \$2,600. There are no additional charges for books or supplies.

**To learn more about this program, attend one of our FREE information sessions. Call (815) 280-1555 to sign up.**



## Components of the program include:

**Introduction to the Process Industry:** This course is designed to introduce you to the chemical process industry and to other related manufacturing industries that require the same skills. It covers the identification of major corporations and the products they produce. (4 hours)

### Process Technician Duties and Responsibilities:

This course introduces the student to typical plant and refinery operations. It covers the operator's duties, tasks and responsibilities in day-to-day operations, as well as conveying emergency operations. Typical shift patterns are covered including the 24-hour (military) system of keeping time. Also covered are workplace skills needed to succeed in the industry. Included are topics concerning understanding the importance of teamwork, problem solving, and health and safety. (8 hours)



**Technical Math for Operators:** This course provides the student with the practical and realistic mathematical problems that are encountered by technicians. By solving the problems, the technical and mathematical aspects are strengthened, thus providing a solid foundation for a career as a technician. (20 hours)

**Chemistry for Operators:** A basic knowledge of organic chemistry is necessary to efficiently operate today's modern refineries and chemical complexes. Topics include basic principles, atoms and molecules, and molecular bonds. All of these complexes deal with organic hydrocarbons, so a fundamental knowledge of these is necessary. Some of the hydrocarbons covered on a molecular basis are hydrogen, methane, butane, and ethane. (16 hours)

**Physics for Operators:** This segment of the petrochemical operators course covers basic physics. The information presented teaches the student to function effectively in typical operating units. Some of the items covered are the gas laws and their applications, properties of matter, Bernoulli's Principle, the physical states of matter, temperature, pressure and heat. (16 hours)

**Distillation:** All the major forms of distillation are shown and examples of operation are given. The different types of distillation are covered along with the reasons why a particular type of process is used. The different types of trays used in towers are explained and examples are shown. (10 hours)

## Looking for a rewarding and well-paying career?

JJC's Process Operations Technology program will help get you there!



**For more information or to register, call (815) 280-1555 or email [processoperator@jjc.edu](mailto:processoperator@jjc.edu).**

Attend one of our FREE information sessions to learn more about this exciting career opportunity.



## Process Operations Technology Program



**Visit us online:  
[www.trainingupdate.org](http://www.trainingupdate.org)**

**Basic Electricity:** This course addresses safe electrical practices and topics such as basic circuit design, control component awareness, interpreting ladder diagrams, use of electrical meters, electrical trouble shooting, fuse and breaker awareness and application, and National Electrical Code requirements for basic circuits. (16 hours)

**Valves and Actuation:** Valves are one of the most used apparatuses within a refinery or chemical complex. This segment of the course covers the different types of valves, their construction, and typical uses of each type. Proper operation, preventative maintenance, and safety precautions pertinent to valves are stressed. The section on actuation is to familiarize the student with actuator principles and terminology. Various manual, fluid powered and electric actuators and their accessories are discussed. (12 hours)

**Reactor Fundamentals:** This course provides an overview of the function of a reactor. Participants will be able to describe exothermic, endothermic, replacement, neutralization, and combustion chemical reactions as wells as reaction variables and their effects. (3 hours)

**Steam and Steam Systems and Traps:** This course is designed to cover the fundamentals of steam generation, with practical information on steam generation chemistry. It also covers handling condensation and steam traps, which are vital in maintaining an economical situation, since they prevent waste. The class covers disc, float, and thermostatic and inverted bucket type steam traps, along with their operation and upkeep. (8 hours)

**Cooling Towers:** Topics covered include the introduction to cooling towers, how cooling towers work, types of cooling towers, components of cooling towers maintenance and location. (3 hours)

**Heat Exchangers:** The floating head, fixed tube, u-tube and air-cooled exchangers are covered in this section. The construction, operation and maintenance aspects are defined and explained so the operator is knowledgeable in the use of exchangers within operating units. Heat exchangers are essential items within refineries and chemical plants. (4 hours)

**Steam Turbines:** Many major types of machinery are powered by steam turbines within operating units. The construction of a typical turbine is covered, along with aspects of its operation. Typical applications are explained and maintenance factors important to its operation are covered. (4 hours)

**Compressors:** Aspects of operation, safety fundamentals and preventative maintenance are covered on centrifugal and positive displacement compressors. Compressor surge and stonewall are also explained in order to show how they affect operation. (4 hours)

**Pumps:** The major types of pumps used in the process industry and the principles of each are covered. The major emphasis is on centrifugal and positive displacement pumps. Safety aspects and pump operations in cold service are also covered. (8 hours)

**Furnaces/Fired Heaters:** The primary aspect of furnace operation is covered in detail. This provides the student with the knowledge necessary to operate them efficiently, economically and safely. Draft, air and fuels are reviewed and the important points for normal operations are emphasized. (5 hours)

**Refrigeration:** Many operating units use refrigeration in one form or another to accomplish separation of various products. Basic refrigeration will be covered in this segment of the course to include the compressor, condenser, expansion valve, accumulator, and chiller. CFC regulations are also discussed. (3 hours)

**Motors:** This course is designed to identify typical motors found in a process plant, their purpose and function. Also covered are the technicians duties and responsibilities and the identification of safe work practices. (8 hours)



**OSHA 10 Safety Certificate:** The OSHA 10-hour training program addresses the common causes of accidents in the workplace. The class consists of 10 hours of safety training minimally addressing 7 OSHA topics plus 2 hours related to safety in the Process Operations field. The students will learn to find OSHA Regulations/rules on the OSHA website, learn the common causes of work place accidents and the rules to be followed to minimize the common causes of those accidents. Successful completion is the student attending all 12 hours of training, passing an exam and participating in group discussions as appropriate. Successful completion will also earn the employee a Safety Card from OSHA. (12 hours)

**Piping & Instrumentation, Symbols & Drawing:** All structures use certain sets of symbols to depict on paper what they represent. This segment of the operator's course covers the normal symbols used in piping, instrumentation and other pertinent structures. P&IDs are covered in detail and examples of flow charts are also covered. (8 hours)

**Instrumentation:** This course is designed to introduce instrumentation for the process operator. Examples of pneumatic and electronic operation are shown, as are control valve operations, variable measurements, remote instrumentation, computer control, control loops and process control. (10 hours)

**Plant Systems Overview:** This course is designed to provide the process operator with overviews of electrical systems, steam systems, water and waste water systems, P&ID systems and the opportunity to work with a computer generated plant simulation. (12 hours)

**Career Readiness:** Career Readiness is designed to prepare individuals for the workforce. This course will review specific work-related skills participants need in order to be successful in the workplace, including areas such as: work habits; personal leadership; communication; teamwork and collaboration; critical thinking and problem solving. To address the importance of effective communication in the workplace, employees will work on complete a cover letter, résumé, and a mock interview. In addition, the Career Readiness program will assess foundational skills using ACT WorkKeys® assessments and participants will earn the ACT National Career Readiness Certificate. (15 hours)

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