



Program Description

Program Name: Professional* Certificate: Wastewater Treatment Operations

Course Fee: \$799.00 (Check for promotions, if any, on our Home Page button: CURRENT PROMOTIONS)

Course Cost in Cost per Hour: \$5.00 per hour

Who is this course for?

This course is meant for people who seek an entry-level position in an industrial or municipal wastewater treatment facility. This course is based on US manufacturing and operational practices. Any person who can use email will be able to participate in this course – no additional skills are required. The course is designed to prepare a student for entry-level blue-collar jobs, where one routinely interfaces with industrial equipment. Keeping the entry-level qualification requirements in view, such jobs pay well. We specialize in creating and providing adult training of this nature – consistent with our slogan: *We Provide **Industry-Ready**[™] training using student-friendly methodologies.*

Course Benefits

This program offers some unique benefits. The main benefit: It increases the chances of a person with only Gr-12 education to get accepted into a high-paying job at an entry-level. There are thousands of wastewater processing plants across the US – some very small and some very big. All of them require workers to manage manufacturing operations. Unfortunately, there are very few institutions that prepare workers for such work. Completion of this course will equip potential workers with highly focused work-place knowledge including safety, basic sciences, and the relevant technical knowledge – all in learned in an easy-to-learn format. These days, due to availability of modern technology and safety regulations, for such jobs most of the physical hard work has been replaced by machines that are operated by humans through computer interfaces; this allows men and women to be equally suitable to handle the work-place requirements.

After a person gets accepted into an entry-level position, the opportunities for advancement are abundant; depending upon personal work ethics and attitude toward learning, a worker can move into higher operational, maintenance or managerial positions. Most of such manufacturing facilities encourage in-house personnel to move up in supervisory and managerial ranks. Learn more about the nature of such jobs from our white paper (***High-Paying Jobs for High School Graduates***) available at our website: www.HoustonIndustrialTraining.com



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Note: We offer this course nationwide. Most of the work related to wastewater is regulated by state authorities. Each state has different educational and experience requirements for licensing. Please print a copy of this course description and show it to wastewater operations plants management and state authorities to ensure this training will be helpful in getting you a job in the wastewater processing industry. In some cases this certificate will help you get an entry level job as an unlicensed helper. You should do this check BEFORE you register for the course. You may wish to explore using this certificate to get an unlicensed entry-level position and then pursue the educational and experience requirements for the license. We make no representation that this course is authorized by any state in any manner.

Course Structure

- a. The course provides industry-ready information in a manner that allows almost anyone, with any background to participate in it. Unlike regular classroom-based learning, this course allows a user to go over the learning materials a number of times and write the test a number of times – this approach results in exceptionally high quality of learning.
- b. The course is web-based and is delivered on-line; and it is completely self-standing. You are not required to buy any textbooks to take this course; also, no supplemental written material or books are provided to the student. All of the relevant material is embedded in the course.
- c. To augment learning, in many learning modules animations and simulations are provided – allowing students to interact with the learning materials and get a feeling for the dynamism of industrial systems.
- d. The course consists of a number of learning modules. Each of the modules consists of learning materials as well as a written test. To pass the course a student has to pass each of the modules. The pass mark is 75%. After going through the learning materials, the student is expected to email the answer sheets for evaluation.
- e. Where necessary, the online modules provide you with a listing of reference material – in case you want to build a personal library or want to do additional research. Again, you do not need to acquire the reference material to complete the course. You are allowed to print the online course material (via print screen) as long as you do so for your own personal use.

Note: Please do not share our course material with others and do not use it for any commercial use. Under all circumstances we maintain copyright to all of the material presented in the course.



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Course Availability: Anytime, from anywhere. This is a totally web-based online course; prospective students may enroll at anytime from anywhere. Also, students can start and participate in the course at anytime from anywhere.

Course Pre-requisites: None. Our courses include all of the necessary math and science material relevant to the course. Any person who can use email will be able to participate in this course – no additional skills are required.

Standard Time to Complete Course:** 181 hours

Professional Development Hours (PDHs):** 181.0 hours

Continuous Education Units (CEUs): 181

Access Allowed to the Course after Registration: 365 days

Instructor: Houston Industrial Training Institute Staff

7 Calendar Days, No Questions Asked Refund Policy

We are committed to provide a zero-risk learning opportunity for prospective students. To this end, we will issue a full refund on monies paid by a student if a refund is asked for within seven calendar days of payment. This applies to all monies paid during the preceding 7 calendar days. Please note that no refund is allowed if the completion certificate has been made available to the student or if more than three calendar days have passed.

How to Register: Visit our Home Page www.HoustonIndustrialTraining.com Please click on the REGISTER button located on the left hand panel. In addition, feel free to ask for clarifications and help by via email from: Registrar@HoustonIndustrialTraining.com. Additional informatory material is available via the How-To Guide button located on our Home Page.

Help for Registered Students: Students can ask for help at any time via email. Send an email to instructor@HoustonIndustrialTraining.com. In your email, please include your name, your Student Code, your course name, your phone number and your email address. We aim is to respond to students within two working days.

Third Party Commercial Interest Disclosure Policy

We do not allow anyone, including the instructors, to solicit any business from the students other than HITI products. Further, no instructor is allowed to present any third party products or software or events to the students. HITI does not allow any third-party compensation related to the learning events or programs. Ask for HITI Policy 25 for details on this subject.



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Required Equipment

1. An ordinary PC (not older than five years).

Note: We do not test our courses on computers other than PC. If your computer is not a PC, we encourage you to take our FREE sample course to ensure your hardware is compatible with our delivery system. It is rare when our courses do not work on non-PC computers. We ask you to do this test BEFORE registering for the course.

2. A good Internet connection. We design most of our instruction pages to download in less than five seconds. Some of the graphics-heavy pages may take longer to download.

3. Adobe Flash Player. Almost all PCs come equipped with this Flash Player. If your computer does not have it, you can download it for free from www.adobe.com.

Notes:

*The term Professional Certificate indicates an initial qualification that leads to a professional vocation, but does not lead to higher education such as an engineering degree.

** Note: The course consists of a number of Learning Modules – all listed below with the standard completion time. The completion-hour number shown here is the sum of standard completion time for all of the modules. The standard learning-module completion time is based on the average of time taken by actual or study-group students, or our estimate. The standard module-completion time assessment excludes breaks of any kind. Depending upon the experience and educational background of a particular student, the actual time taken by a particular student may vary by a wide margin from what is noted here. We give credit for PDHs and CEUs per information provided in this document, and NOT the actual time taken by a particular student.

Professional Development Hours (PDHs) are equal to the standard learning-module completion time. The corresponding Continuing Education Units (CEUs) are obtained by dividing the standard time by ten.



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Listing of included Learning Modules

Basic Industrial Safety

Standard Time to Complete: 6 hours

Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** why paying attention to safety is important in an industrial plant.
2. **DESCRIBE** employer and employee responsibilities in reference to personnel safety.
3. With reference to an industrial plant, **IDENTIFY** common hazards and possible protection against them.
4. **EXPLAIN** why special attention is paid to hazards associated with Hydrogen Sulfide gas.
5. **DESCRIBE** safety hazards posed by electricity, confined spaces and toxic gases.
6. **SELECT** basic protective equipment for common hazards in an industrial plant.



Basic Hazard Communication

Expected Time to Complete: 10 hours

Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** the purpose and the key elements of the Federal Hazard Communication Standard (HCS.) You will also be able to **IDENTIFY** other common names used to refer to this standard.
2. **DESCRIBE** how a hazardous chemical is identified in a workplace.
3. **DESCRIBE** the purpose and what is meant by the term MSDS. You will also be able to describe the key elements of an MSDS. Using MSDSs, you will also be able to **SELECT** appropriate protective measures when handling chemicals.
4. **DESCRIBE** the nature of the NFPA and HMIS/HMIG hazard communication methods. You will also be able to **DESCRIBE** what is meant by the terms TLV, PEL, TWA, Acute Effect, Acute Toxicity, Chronic Effect, Chronic Toxicity, Carcinogen, Flammable Liquid, Combustible Liquid, and Chemical Reactivity.
5. **DESCRIBE** the nature of the DOT methods for hazard chemical identification.



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6. **DESCRIBE** the necessary training activities required to comply with the Federal Communication Standard (HCS.)

Basic Lockout-Tagout

Standard Time to Complete: 10 hours

Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** the key reasons for implementation of lockout-tagout procedures.
2. **DESCRIBE** what is meant by the term “energized equipment.” You will be able to list various ways by which equipment “energized state” can occur.
3. **DESCRIBE** under what conditions lockout-tagout procedures are required. You will also be able to **DESCRIBE** the employer’s responsibilities for implementation of such procedures.
4. **DESCRIBE** the training requirements prescribed by OSHA for lockout-tagout procedures. You will also be able to **DESCRIBE** the prescribed worker training requirements under OSHA’s regulations.
5. **DESCRIBE** the key items that need to be considered for electric power lockout-tagout systems. In reference to the electrical requirements, you will be able to **DESCRIBE** what is meant by the term “qualified employees;” you will also be able to **DESCRIBE** the responsibilities of such employees.
6. **DESCRIBE** the ten general procedural steps, outlined in the learning module, for implementation of Lockout-Tagout Procedure.

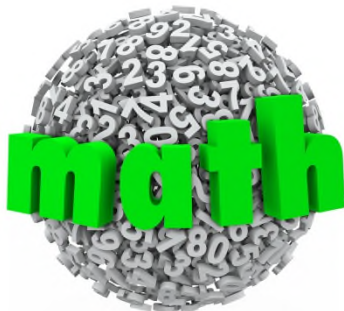


Math for Technicians and Operators

Standard Time to Complete: 20 hours

Learning Outcomes

On successful completion of this learning module, you will be able to:



1. **ADD, MULITPLY, DIVIDE, and SIMPLIFY** fractional numbers; you will also be able to **ADD, MULITPLY, DIVIDE, and SIMPLIFY** decimal numbers; you will also be able to **CONVERT** fractional numbers into decimal numbers and vice versa.
2. **CALCULATE** areas and volumes of simple figures.
3. **MANIPULATE** and **WORK WITH** simple equations.
4. **CREATE** graphical representations of two-dimensional numeric relationships.



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5. **CALCULATE** percentage values of simple quantities.
6. **CONVERT** one measurement unit into another measurement unit.

Electrical Safety

Estimated Time to Complete: 20 hours

Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **IDENTIFY** the key components of a basic electric circuit. You will also be able to **EXPLAIN** the function of key components of a basic electric circuit.

2. **DESCRIBE** the common hazards posed by electricity. You will also be able to **STATE** the protective measures that should be taken by workers and electricians.

3. **DESCRIBE** what is meant by the term “grounding,” and how it is accomplished.

4. **DESCRIBE** how an improperly grounded system can become hazardous for workers.

5. **DESCRIBE** how a properly grounded system works and provides safety for workers and electricians. You will also be able to **DIFFERENTIATE** between a Service Ground and an Equipment Ground.

6. **DESCRIBE** how a Ground Fault Current Interrupter (GFCI) works and provides safety.



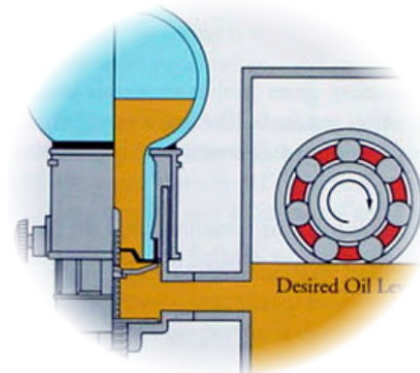
Basic Industrial Lubrication

Expected Time to Complete: 10 hours

Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** the main purpose of industrial lubrication.
2. **DIFFERENTIATE** between different lubrication regimes – hydrodynamic lubrication, mixed film lubrication and boundary lubrication.
3. **DESCRIBE** main characteristics of lubricants, such as viscosity, specific gravity, pour-point, oxidation resistance, shear stability, flash-point, etc.
4. **IDENTIFY** different types of bearings used in the industry.
5. **IDENTIFY** different types of lubrication systems. You will also be able



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to **MATCH** a lubricant to field service conditions.

6. **DESCRIBE** main operator-functions pertaining to equipment lubrication.

Process Industry Valve Fundamentals

Expected Time to Complete: 20 hours

Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** the key components of common industrial valves: gate, globe, ball, butterfly, and plug.
2. **DIFFERENTIATE** between operational aspects of a gate valve and a globe valve.
3. **IDENTIFY** different types of closing elements used in gate valves.
4. **DESCRIBE** various flow characteristics of control valves such as linear, equal percentage, fast opening, and slow opening.
5. **DESCRIBE** some common ratings marked on the body of industrial valves.
6. **DESCRIBE** common operational and maintenance practices suitable for industrial valves.



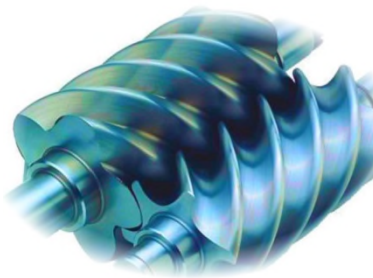
Compressed Air Fundamentals

Expected Time to Complete: 10 hours

Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** the compressed air system classification system; you will also be able to **DESCRIBE** common compressed air applications.
2. **DESCRIBE** what is meant by the term "air humidity." You will also be able to **DESCRIBE** the relationship between air moisture content and air temperature and pressure.
3. **DESCRIBE** advantages of multistage compression systems. You will also be able to **DESCRIBE** the role of intercoolers and aftercoolers. You will also be able to **DESCRIBE** how multistage air compression is executed.
4. **DESCRIBE** what is meant by the term "dew point," and why it is controlled.



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You will also be able to **DESCRIBE** how dew point in compressed air systems is lowered.

5. **IDENTIFY** main types of air compressors; you will also be able to **DESCRIBE** how single-acting and double-acting compressors operate.

6. **DESCRIBE** the basic function and operation of typical air dryers.

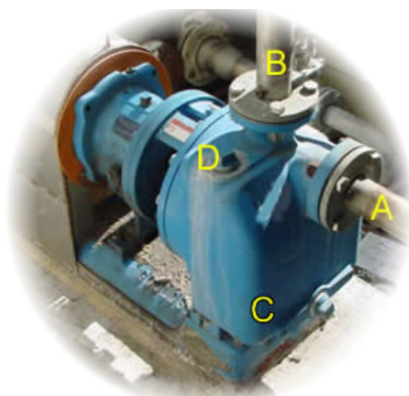
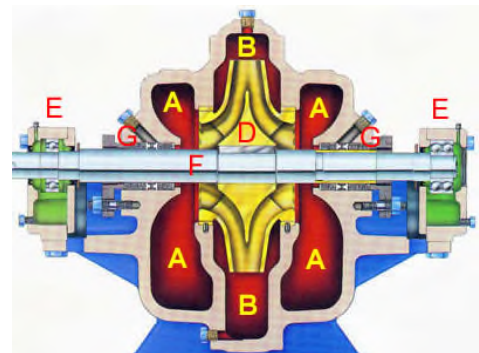
Introduction to Industrial Pumps

Expected Time to Complete: 5 hours

Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** the key components of a basic centrifugal pump.
2. **DESCRIBE** how a centrifugal pump converts mechanical energy (supplied by the prime mover) into energized water. Here the term “energized” implies an increase in the energy content of water as it flows through a pump.
3. **DIFFERENTIATE** between the key operational aspects of centrifugal pumps and positive displacement pumps.
4. **DESCRIBE** how a double-acting reciprocating pump works.
5. **DESCRIBE** how gear pumps and diaphragm pumps work.
6. **DESCRIBE** the main operator functions regarding custodianship of centrifugal pumps.



Centrifugal Pump Operation

Standard Time to Complete: 20 hours

Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** different types of centrifugal pumps.
2. **DESCRIBE** what is meant by the term “priming”, and how self-priming pumps work.
3. **DESCRIBE** how a multistage centrifugal pump works.
4. **DESCRIBE**, in reference to centrifugal pumps, what is meant by “Suction Lift” and “Suction Head.”



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5. **DESCRIBE** starting procedures for centrifugal pumps with various piping configurations on the suction side.

6. **IDENTIFY** and take **CORRECTIVE** action for common operational problems associated with centrifugal pumps.

Wastewater1000: Wastewater Basic Safety

Standard Time to Complete: 4 hours

Learning Outcomes

On successful completion of this learning module, you will be able to

DESCRIBE:

1. General safety practices utilized in wastewater treatment plants.
2. Various hazards which could be faced by operators in a wastewater treatment plant.
3. The necessary worker protective measures needed against hazards associated with wastewater treatment plants.
4. The hazards posed by toxic, suffocating and explosive gases.
5. The specific hazards associated with wastewater collection systems.
6. The specific hazards associated with wastewater treatment plants.



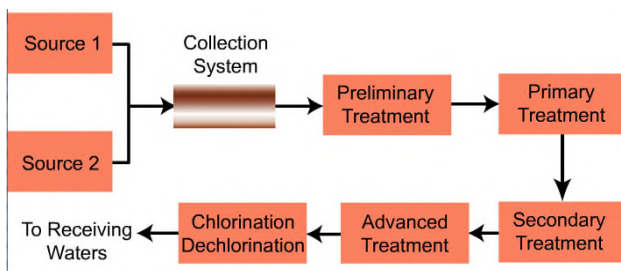
Wastewater1050 - Wastewater Treatment Overview

Standard Time to Complete: 4 hours

Learning Outcomes

On successful completion of this learning module, you will be able to **DESCRIBE:**

1. The importance of our natural water resources.
2. Sources of natural water resources.
3. How water is polluted and the main sources of wastewater.
4. The main sources of wastewater.
5. The nature of wastewater treatment processes.
6. How to protect and conserve our natural water resources.



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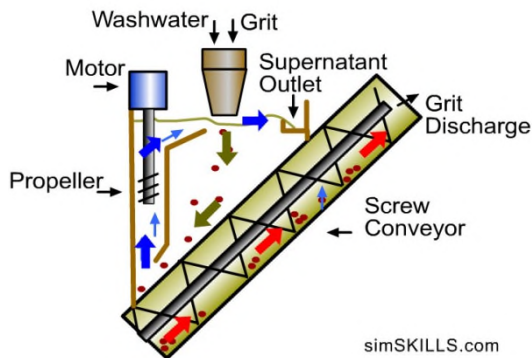
Wastewater1100 - Basic Wastewater Collection

Standard Time to Complete: 4 hours

Learning Outcomes

On successful completion of this learning module, you will be able to **DESCRIBE**:

1. The purpose of sewage collection systems.
2. The major sewage line components.
3. The basic information about sewage manholes.
4. The purpose of lifting stations.
5. The purpose of collection system ventilation.
6. The purpose of a "drop manhole."



Wastewater1200 - Preliminary Treatment Processes

Standard Time to Complete: 4 hours

Learning Outcomes

On successful completion of this learning module, you will be able to **DESCRIBE**:

1. The purpose and advantages of Preliminary Treatment.
2. How the "Screening" processes work.
3. How the "Grinding" processes work.
4. How the "Grit Removal" processes work.
5. How the "Pre-aeration" processes work. How "Flow Measurement" processes work.
6. How the "Flow Equalization" processes work. How "Grease Removal" processes work.



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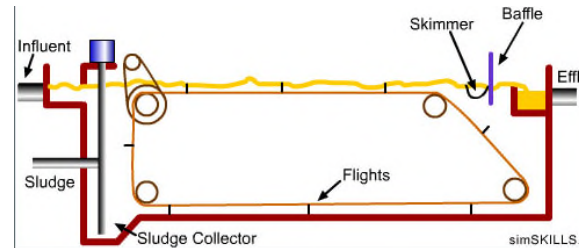
Wastewater1300 - Clarification

Standard Time to Complete: 4 hours

Learning Outcomes

On successful completion of this learning module, you will be able to **DESCRIBE**:

1. What is meant by Primary Treatment.
2. What is the purpose of clarifiers.
3. What is meant by the term "sedimentation".
4. What is the difference between primary and secondary clarifiers.
5. What are the main clarifier zones. How and Imhoff Tank works.
6. What performance you can expect from a primary and a secondary clarifier.



Wastewater1350 - Fixed Film Processes

Standard Time to Complete: 4 hours

Learning Outcomes

On successful completion of this learning module, you will be able to **DESCRIBE**:

1. How fixed film treatment processes work.
2. The major components of a trickling filter.
3. The classifications (types) of trickling filters.
4. How Rotating Biological Contactors (RBC's) work.
5. What is meant by the term "sloughings" and their origin.
6. How humus sludge from the Secondary Clarifier is disposed of.



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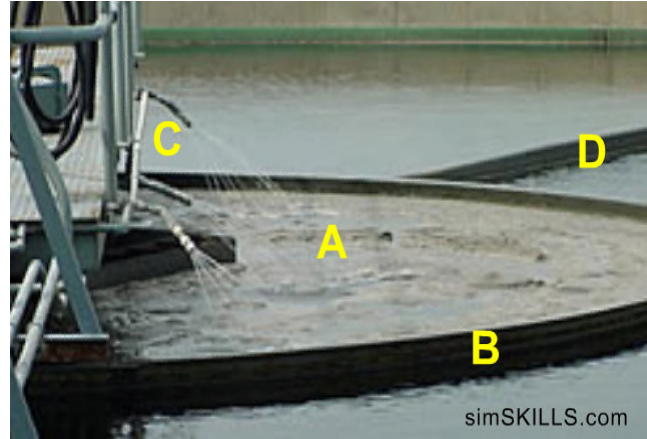
Wastewater1400 - Basic Activated Sludge Systems

Standard Time to Complete: 4 hours

Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **Describe** the role of microorganisms in an Activated Sludge System. You will also be able to **describe** what is meant by the term "Activated Sludge."
2. **Describe** what is meant by the terms: Aeration, aerobic process, biological reactor or aeration tank.
3. **Describe** what is meant by the terms: Return Activated Sludge (RAS), mixed liquor, MLSS, MLVSS, MLFSS, and waste activated sludge (WAS).
4. **Describe** how an Aeration Tank works and what are its key operational parameters.
5. **Describe** what is meant by the term Biochemical Oxygen Demand (BOD).
6. **DESCRIBE** the overall operation of and operational practices/parameters associated with an Activated Sludge System.



Wastewater1450 - Basic Wastewater Treatment Ponds

Standard Time to Complete: 4 hours

Learning Outcomes

On successful completion of this learning module, you will be able to **DESCRIBE**:

1. The general nature of wastewater treatment ponds.
2. The purpose of wastewater treatment ponds.
3. The general concepts of water flowpaths in ponds - including short circuiting of water in a pond.
4. The wastewater treatment pond performance factors.
5. The general nature of major types of wastewater treatment ponds.
6. Different names associated with wastewater treatment ponds and if such ponds are considered an effective



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wastewater system.

Wastewater1500 - Basic Sludge Handling

Standard Time to Complete: 4 hours

Learning Outcomes

On successful completion of this learning module, you will be able to **DESCRIBE**:

1. The nature and types of sludge.
2. What is meant by sludge digestion.
3. The basic concepts regarding aerobic sludge.
4. The basic concepts regarding anaerobic sludge.
5. The basic concepts regarding digester operation.
6. The basic concepts regarding sludge dewatering and final disposal.



Wastewater1650 - Basic Disinfection

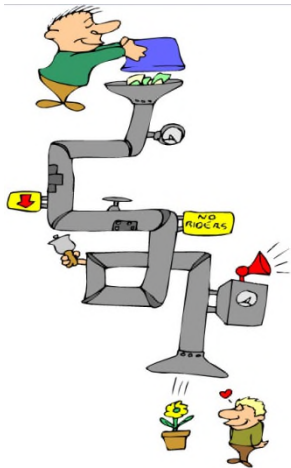
Standard Time to Complete: 4 hours

Learning Outcomes

On successful completion of this learning module, you will be able to

DESCRIBE:

1. What is meant by the term "disinfection" and the reasons for disinfection of wastewater.
2. The basic chlorination concepts and the reasons for dechlorination.
3. The factors which influence disinfection and the description of main disinfection methods.
4. The key regulatory requirements for disinfection.
5. The basic information about chlorine cylinders and tanks.
6. The safety considerations relating to chlorine.





Wastewater1700 - Wastewater Basic Laboratory

Controls

Standard Time to Complete: 4 hours

Learning Outcomes

On successful completion of this learning module, you will be able to **DESCRIBE**:

1. The purpose of laboratory controls.
2. The basic ideas about sampling methods.
3. How to preserve a wastewater sample.
4. The basic knowledge about these tests: BOD, COD, pH, TSS, VSS, Chlorine Residual, Dissolved Oxygen, Settleable Solids, and Oxygen Uptake Rate.
5. The purpose of microscopic examination.
6. DESCRIBE how laboratory controls help in management of a wastewater treatment system.



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Course Accreditation



Houston Industrial Training Institute has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102. In obtaining this approval, HITI has demonstrated that it complies with the ANSI/IACET 1-2007 Standard which is widely recognized as the Standard of good practice internationally. As a result of their Authorized Provider membership status, HITI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET 1-2007 Standard."

Information: Registrar@HoustonIndustrialTraining.com; Phone: 800-610-8486; Fax: 866-490-7959. Mail: 5348 Vegas Drive, Suite 998, Las Vegas, Nevada, 89108. For latest information on how to contact us, please go to our web-page HoustonIndustrialTraining.com and click on the **Contact Us** button.



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