

Wastewater Classes

Wastewater Operator Math – DEP Course ID# 2265 – Approved for 6 Wastewater Contact Hours

The purpose of this course is to train wastewater operators the math formulas and calculations needed to properly operate and maintain a treatment facility. Since most operators don't use math formulas or calculations on a daily basis, a review is often needed to refresh an operator on the proper math calculations needed for proper process control. Circumference, perimeter & area, volume, flow, detention time, percentages, pressure and head, dosages, horsepower, F/M ratio, sludge volume index, solids loadings rates, hydraulic & organic loading rates and sludge age will be discussed. By the end of this course you will be able to:

- Understand the proper formulas used to calculate wastewater questions
- Calculate the proper math questions needed for process control
- Realize the different methods used in wastewater calculations

Introduction & Fundamentals of Wastewater – DEP Course ID# 2266 – Approved for 6 Wastewater Contact Hours

The purpose of this course is to expose new wastewater treatment facility operators the information needed to realize the many aspects of wastewater treatment. Many new operators receive little formal training and must learn as they go. This course will give them a jump start by showing them many different treatment schemes as well as the various operation and maintenance responsibilities included in this field. The role of a treatment facility operator, characteristics of wastewater, basic wastewater treatment processes, preliminary treatment, primary treatment and a general overview of secondary treatment will be discussed. By the end of this class you will be able to:

- Understand the roles of the Treatment Facility Operator and describe the responsibilities of each
- Describe the typical composition of raw wastewater and the effects wastewater discharges have on the receiving stream
- Use mathematical formulas to solve for detention time, weir overflow, surface loading, and solids loading

Introduction to Wastewater – DEP Course ID# 2610 – Approved for 3 Wastewater Contact Hours

The purpose of this course is to expose new wastewater treatment facility operators the information needed to realize the many aspects of wastewater treatment. Many new operators receive little formal training and must learn as they go. This course will give them a jump start by showing them many different treatment schemes as well as the various operation and maintenance responsibilities included in this field. The role of a treatment facility operator, characteristics of wastewater, basic wastewater treatment processes, preliminary treatment, primary treatment and a general overview of secondary treatment will be discussed. By the end of this class you will be able to:

- List the roles of the treatment facility operator and describe the responsibilities of each
- Describe the typical composition of raw wastewater
- Explain the effects of wastewater discharges on the receiving stream

Fundamentals of Wastewater – DEP Course ID# 2608 – Approved for 3 Wastewater Contact Hours

The purpose of this course is to further explain the many treatment methods and techniques of wastewater such as preliminary, primary, secondary, and etc. Also, this class will expose wastewater treatment facility operators to the information needed to understand some of the biological activity that needs to take place with the treatment units. Many secondary treatment methods are explained in the class to provide the operators what they need when operating different wastewater treatment facilities. By the end of this class you will be able to:

- Explain the general purpose of the treatment processes
- Use mathematical formulas to solve for detention time, weir overflow, surface loading, and solids loading
- List the biological secondary treatment processes and understand the many modes of operation within the secondary treatment system

Troubleshooting & Optimizing Activated Sludge Processes – DEP Course ID# 2267 – Approved for 6 Wastewater Contact Hours

The purpose of this course is to expose wastewater treatment facility operators to the skills needed to effectively troubleshoot and optimize the activated sludge treatment process. This course includes a relatively in-depth presentation of the microbiology and chemistry that occurs in the activated sludge process. Practical & direct strategies for operation and troubleshooting is what is needed, not design calculations. This course addresses the practical aspects of operating, optimizing, and troubleshooting. What is troubleshooting, how does the activated sludge process provide treatment, multiple case studies, how to improve facility performance and products to assist with operation will be discussed. By the end of this class you will be able to:

- Explain the concept of troubleshooting
- Explain physical, biological and chemical interactions required to accomplish various levels of treatment
- Evaluate & identify performance limiting factors

Troubleshooting & Optimizing Ponds and Lagoons – DEP Course ID# 2607 – Approved for 6 Wastewater Contact Hours

The purpose of this course is to expose wastewater treatment facility operators to the skills needed to effectively troubleshoot and optimize their wastewater lagoon treatment processes. This course includes a relatively in-depth presentation of the microbiology and chemistry that occurs in lagoons. Practical, direct strategies for operation and troubleshooting lagoons is what is needed, not design calculations. This course addresses the practical aspects of operating, optimizing, and troubleshooting. What is troubleshooting, how does a pond or lagoon provide treatment, case studies, how to improve facility performance and products to assist with operation will be discussed. At the end of this course you will be able to:

- Explain the concept of troubleshooting
- Explain physical, biological and chemical interactions required to accomplish various levels of treatment
- Evaluate & identify performance limiting factors

Pond & Lagoon Operation & Maintenance – DEP Course ID# 2604 – Approved for 6 Wastewater Contact Hours

The purpose of this course is to expose wastewater treatment facility operators to the skills needed to effectively operate and maintain ponds & lagoons. Many lagoon operators have had little formal training, however, operators have a high interest in these subjects if the training is kept relevant to what they do. This course is to familiarize the participants with the uses, purposes, and maintenance of ponds & lagoons. A general overview, general operation & maintenance procedures to provide quality treatment, case studies and products to assist with operation will be discussed. By the end of this class you will be able to:

- Identify three types of ponds
- Discuss the advantages and disadvantages of using ponds for treatment
- List the three general types of factors affecting pond operation

The Activated Sludge Process - DEP Course ID# 2666 – Approved for 16 Wastewater Contact Hours

This class is a "one stop shop" for operators of activated sludge facilities. The course is packed with information and provides an overview of the activated sludge process and components. From start to finish, the activated sludge system is explained in detail including aeration systems, new facility start-up procedures, process control strategies, typical operational problems encountered, microbiology, and reasons for modifications, pure oxygen, nitrification and denitrification along with complete BNR. Many times operators depend on engineers to think for them and tell them what to do during an upset. This class will enable the operator to think more on his/her own thus making process control adjustments easier and quicker. By the end of this class you will be able to:

- Understand the activated sludge process and its control variables along with the key monitoring points
- List the various types of nitrogen and phosphorus removal mechanisms and explain how they work
- Understand the operating parameters required for nitrification and denitrification in a suspended growth reactor

Activated Sludge-The Process, Aeration & Startup - DEP Course ID# 2691 - Approved for 3 Wastewater Contact Hours

The purpose of this class is to provide an overview of the activated sludge process, aeration systems, and new facility start-up procedures. A lot of operators have been doing things at the facility on a "this is how we have always done it" mode of operation. This class will help them to change modes to a more proactive thought process. Also, by knowing the information in this course, the operator may be able to perform simple upgrades to the facility such as switching to fine bubble aeration. Many operators start out not knowing how to startup a facility. This class will guide them through that process easier. A general description of the activated sludge process, aeration systems and new facility start-up procedures will be discussed. By the end of this course you will be able to:

- Describe the activated sludge process and its control variables
- Explain the purpose and methods of aeration and three types of diffusers
- Explain the purpose of facility and equipment review prior to facility start-up

Activated Sludge-Strategy, Problems, Microbiology - DEP Course ID# 2690 - Approved for 6 Wastewater Contact Hours

The purpose of this course is to provide an overview of the activated sludge process control strategies, typical operational problems encountered during the process and the microbiology of the activated sludge process. Many operators only know how to physically operate their facility and depend on their Engineer to guide them through problems. This class will give them a better understanding of what to do during an operational upset so they can react quicker and recover faster so that the NPDES permit is not violated. Knowing the basic process control strategies needed along with the microbiological reactions is the key to proper operation. By the attendees participating in the facility troubleshooting tour, they will experience first hand on how to troubleshoot their own system. By the end of this class you will be able to:

- Explain possible facility changes that may result in process operational problems
- Define operational problems and identify possible solutions
- Explain why microbiology is important to the activated sludge process

Activated Sludge-Oxygen, SBR's, Modifications – DEP Course ID# 2664 - Approved for 3 Wastewater Contact Hours

The purpose of this course is to discuss the reasons for modifying the conventional process and to introduce the components of modifications. Many new expansions or upgrades include the SBR technology, leaving operators to change their mode of thinking for process control. This class will assist operators in making those changes so that treatment is optimal. Also, the pure oxygen system has its advantages and disadvantages. The methodology along with the safety considerations will be addressed when using this type of system. By the end of this class you will be able to:

- List and explain other common modifications of operating the activated sludge process
- Describe the stages of operation for a Sequencing Batch Reactor
- Understand a pure oxygen activated sludge system and its component parts.

Activated Sludge-BNR – DEP Course ID# 2665 - Approved for 4 Wastewater Contact Hours

The purpose of this course is to provide an overview of the removal of nitrogen and phosphorus from wastewater as well as an overview of the various mechanisms used to accomplish these tasks. BNR is becoming a big treatment issue. Many operators have a hard time understanding nutrients and how they affect the receiving stream. This class gives a thorough explanation of nutrients, their forms and the proper methods to reduce them. If operators can understand nitrification and denitrification and make it happen at their facility, BNR becomes a lot easier to accomplish.

By the end of this class you will be able to:

- Explain what nitrogen and phosphorus is and why it needs to be removed from wastewater and its forms
- List the various types of nitrogen and phosphorus removal mechanisms and explain how they work
- Understand the operating parameters required for nitrification and denitrification in a suspended growth reactor

Solids Handling and Disposal – DEP Course ID# 2663 - Approved for 3 Wastewater Contact Hours

The purpose is to provide an overview of the primary methods of solids digestion. The complete digestion and final disposal of sludge is an integral part of the wastewater treatment process. The digestion process reduces the volume of the volatile portion of the sludge and creates less volume to deal with for the processes that follow. These processes include dewatering, hauling, incineration, composting, disposal in a landfill or land application. In general, the less volume, the less expense is incurred. With today's increasing chemical technologies it is important to review your chemical dewatering options often to reduce costs. By the end of this class you will be able to:

- Explain the purpose of sludge thickening as well as the various methods used to thicken sludge
- Realize why solids are digested and how the aerobic and anaerobic digestion process works
- List methods for dewatering and disposing of sludge

Flow Meters 101 - DEP Course ID# 2661 - Approved for 3 Wastewater Contact Hours

The purpose of this course is to provide a basic understanding of flow metering in the operation of collection systems and wastewater treatment facilities. Most operators wait until they have a problem with their flowmeter to become familiar with it and then they have a dealer repair the unit. Through the hands on demonstration in this class, the attendees will be able to have first hand experience using flowmeters. Flow meter technologies, calibration, maintenance and troubleshooting will be discussed. By the end of this class you will be able to:

- Understand why a knowledge of flow metering is important in the operation of collection systems and wastewater treatment facilities
- Calculate flow when given area and velocity
- Describe the common problems associated with flow meters through hands-on demonstrations

Advanced Wastewater Treatment – DEP Course ID# 2662 - Approved for 6 Wastewater Contact Hours

The purpose of this course is to provide participants with an introduction to the basic concepts of some common advanced wastewater treatment processes and systems. The purpose of advanced treatment, also known as tertiary treatment, is to further clean the effluent from the secondary processes. Since these tertiary processes generally follow secondary treatment, they are advanced processes. While not all wastewater treatment facilities use the advanced processes discussed in this class, the national trend is toward treatment beyond basic secondary treatment to produce more environmentally friendly effluent. Therefore, it's important for wastewater treatment operators to become familiar with advanced wastewater treatment processes and systems. Odor control, effluent polishing, phosphorus removal and nitrogen removal will be discussed in this class. By the end of this class you will be able to:

- Understand two distinct technology options for removing phosphorus from wastewater
- Identify three distinct technology options for removing nitrogen from wastewater
- Explain the purpose and process of Nitrification & Denitrification

SBR Accelerated Training – DEP Course ID# 7267 – Approved for 75 Wastewater Contact Hours

The purpose of the course is to provide accelerated training to the operations staff of an SBR wastewater treatment facility. The ethical duties and responsibilities of a certified operator are addressed in this course. Also, this course will provide a good understanding of the activated sludge process including aeration systems, new facility start-up procedures, influent head works, seeding, process control strategies, typical operational problems, microbiology, UV Disinfection O/M, hydraulics, calculations, chemical dosages, chlorine disinfection and BNR. The class will give operators a better understanding of what to do during an operational upset so they can react quicker and recover faster so that the NPDES permit is not violated. By the end of the course, participants will have a great understanding of the activated sludge process.

- Operate SBR components & work through equipment startup failures
- Demonstrate proper sample collection and testing techniques and understand accurate data collection & spreadsheets
- Discuss oxic and anoxic conditions for BNR & understand proper process control promotes good effluent