Drinking Water Treatment Technology

July 20–August 28, 2020

GUIDED ONLINE COURSE

Earn
CEU: 2.4
PDH: 24

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PART OF ASCE’S SIX-WEEK SUMMER 2020 ACCELERATED COURSE PROGRAMS
ASCE announces accelerated courses!
You asked, we listened—this is one of our most popular 12-week courses offered at an accelerated pace this summer, 6-weeks! All the same great content, released at a faster rate.

About this course
Drinking Water Technologies are rapidly changing to meet a variety of regulatory requirements, emerging contaminants, and customer demands. This course will focus on understanding how these technologies work and when to apply them. Knowing the breadth and depth of drinking water technologies is important for anyone involved in drinking water.

After you complete this Introduction course, consider taking the next step by completing four additional Guided Online Courses to earn your Water Treatment Certificate.

The other four programs are:
- The Fundamentals of Water Treatment Processes: Physical, Chemical, and Biological
- Planning for Water Treatment Plant Design
- Surface Water Treatment Plant Design
- Groundwater Treatment Design

ASCE’s Water Treatment Certificate Program is a series of career-focused courses taught by practicing engineers and university professors to provide professional engineers in-demand skills used in the field of water treatment. Learn how to use the technology to make drinking water from groundwater, lakes, rivers, streams, oceans, stormwater, and wastewater reuse to all the planning aspects required to lay the groundwork for a new water treatment plan.

Certificate program enrollment saves you up to 35% compared to purchasing courses individually.

YOUR INSTRUCTORS
Lee H. Odell, P.E, M.ASCE
Peter H. Kreft, P.E.
In this course, you will learn:

- To distinguish modern surface water treatment methods from past methods and describe this evolution.

- Why chemical mixing, charge neutralization, and floc formation are critical components of all surface water treatment processes.

- How to describe the different types of clarification systems used in earlier plants and the advantages/disadvantages of each method.

- To understand how filtration differs from clarification.

- What new technologies can be applied to disinfect water to the same degree as we can detect contaminants.

- How to identify various chemicals used in groundwater treatment and how they are used.

- An understanding of chemical feed system design and design considerations.

- The evolution of different groundwater treatment systems and the drivers that led to this evolution.

- To state the approximate cost of new technologies and compare older systems with newer systems.

- To understand the more common technologies deployed for the removal of contaminants found in groundwater.

- To distinguish the technologies available for the removal of naturally occurring compounds from the technologies available for the removal of “man-made” contaminates such as VOCs, nitrates and arsenic, including new technologies.

Upon completion of the course, you will be able to:

- Determine how rapidly changing regulatory requirements and technologies need to be applied to deal with emerging contaminants and customer demands.

- Demonstrate a thorough understanding of the planning elements needed to develop a water treatment plant—from energy consideration and permitting needs, to source water development and pilot testing.

- Explain the major unit processes used in water treatment, including chemical, physical, and biological processes.

- Demonstrate the process design criteria for all types of groundwater treatment issues: including iron and manganese, nitrates, radionuclides, arsenic, and many more!

Who Should Attend?

- Civil engineers involved in water treatment planning or design.

- Water utility managers planning or operating groundwater treatment facilities.
WEEK 1: Surface Water Treatment Overview; and Rapid Mixing, Coagulation and Flocculation Technologies

- Surface Water Quality: rivers, lakes, algae, turbidity, EDCs, and distribution WQ
- Traditional Treatment Technologies: in-line, direct, conventional, and slow sand
- High Rate Clarification: ozone and biological filtration
- Multiple Barriers
- What Coagulation Chemicals Do: charge neutralization, agglomeration, and van der waals forces
- Alternative Coagulants: aluminum salts, iron salts, polymers, and pre-hydrolyzed aluminum salts
- How Rapid Mixing Occurs: static mixers, in-line power mixers, turbine basin mixers, side stream mixers, and no mixing needed for Sweep Floc?
- What Role Does Flocculation Play, Settling Velocities, and Floc Shear

WEEK 2: Clarification and Filtration

- Traditional Clarification Technology: colloids, settling velocities, and sedimentation
- Lime Softening
- Settling Plates and Tubes, Softening
- Innovation in Clarification: sand ballasted clarification, vacuum assisted up flow clarification, DAF & high Rate DAF, and recycled solids upflow clarification
- Pre-Sedimentation, Riverbank Filtration
- Membranes (micro, ultra, nano, and reverse osmosis)
- Media Filters (sand anthracite and GAC), Filter Underdrain Systems
- Biological Filters
- Slow Sand Filtration
- Riverbank Filtration
- Backwashing and Air-Scour
- Mechanical Filtering Systems

WEEK 3: Disinfection and Oxidation Strategies, and Chemical Feed Systems

- UV
- Ozone
- Chlorination
- Chlorine Dioxide
- Chloramination
- Permanganate
- Peroxide
- Advanced Oxidation
- Understand Chemical Feed System Design and Design Considerations
- Liquid Feed Systems
- Dry Feed Systems
- Specialized Feed System
- Chemical Safety
- Integrated Design

WEEK 4: Groundwater Treatment and Contaminant Removal

- Ion Exchange
- Adsorption Technologies
- Filtration Technologies
- Precipitation Technologies
- Aeration/Degassing Technologies
- Membrane Technologies
- Aeration/Degassing
- Iron and Manganese Removal
- Nitrate Removal
- Arsenic Removal

WEEK 5: Removal of Less Common Contaminants and Developing Marginal Water Supplies

- Radionuclides Removal
- Hexavalent Chromium Removal
- Organics Removal
- Perchlorate Removal
- Brackish Water Treatment and Desalination
- Water Reuse Treatment for Potable Use
- Aquifer Storage and Recovery

WEEK 6: Residuals Handling and Distribution Water Quality

- Types of Residuals
- Regulations for Dewatering and Disposing of Water Treatment Plants
- Centrifuges
- Filter Presses
- Belt-filters, Lagoons
- Sludge Drying Beds
- Evaporation Ponds
- Wetland Treatment
- Recycling Stream Treatment
- Corrosion Control
- Disinfection by Product Reduction
- Prevention of Nitrification
- Contaminant Prevention
- Monitoring Technologies
- Cleaning and Flushing Technologies

This course outline is subject to change.
ASCE is committed to providing you with a variety of ways to obtain your CEUs and PDHs. You can earn credits through our Guided Online Courses by completing all course videos and exercises. You will have two weeks after the end of the course to complete all videos and activities.

We also offer Certificate Programs, which are made up of multiple Guided Online Courses, enabling you to go broader and deeper into specific technical areas.

How You Can Earn Continuing Education Units (CEUs) and Professional Development Hours (PDHs)
Maintaining your credentials is easier than ever because ASCE offers many options to qualify for CEUs and PDHs. You can earn CEUs and PDHs through participation in many ASCE courses, events, and seminars. These include:

- ASCE Week
- Guided Online Courses and Certificate Programs
- Live training sessions streamed over the Internet
- On-demand recorded webinars and seminars
- In-person seminars

These are the perfect platforms to exchange ideas, meet a diverse group of colleagues, participate in discussions, learn about the latest innovations in your field, and earn CEUs and PDHs.

**ASCE Week**
Attend this week-long event and increase your knowledge with new and high-demand seminar topics, technical tours and networking, and the opportunity to earn 40+ PDHs.

**Online Learning**
For those of you whose work and home schedules are hectic, ASCE offers Guided Online Courses and Certificate Programs, Live Webinars, and On-demand recorded webinars and seminars. You’ll be able to view or hear seminars right on your computer and then take a test online. And you will be earning CEUs and PDHs right from the comfort of your own home or office...at any time, day or night!

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