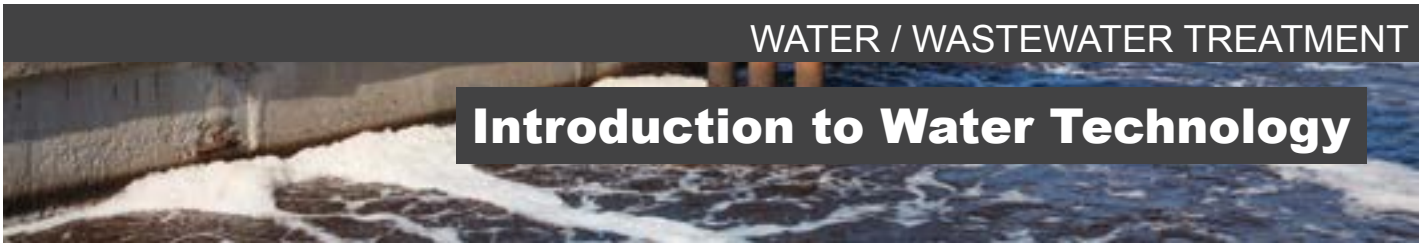

Introduction to Water Technology

Course 381: Introduction to Water Technology

Covers the nature, use, and properties of water. It traces the history of water treatment methods from ancient times to today's sophisticated systems. The effects of chemical and biological factors on the purity of water are explained.

TPC Training is accredited by IACET to offer **0.5 CEU** for this program.

Lesson 1: Water: The Basic Resource

Topics

The Water Cycle; Precipitation; Surface Runoff; Groundwater; Lots of Water, But...; How We Use Water; Municipal Use; Industrial Use; Agricultural Use; Waste Disposal; Waste Not - Want Not; Beginning of Waterworks; Roman Waterworks; Centuries of Neglect; Beginning of Water Treatment; Upgrading Water Today

Objectives

- Name the continuing processes that make up the water or hydrologic cycle.
- Describe the atmospheric process that produces precipitation.
- Identify the users of municipal water supplies.
- Point out some of the important advances made in water treatment since 1900.
- List the benefits of the Federal Water Pollution Control Act Amendment of 1972.

Lesson 2: Water Collection, Treatment, and Distribution

Topics

Collecting Surface Water; Collecting Ground Water; Transmission of Water; Why Treat the Supply Water?; Types of Treatment; Treatment in the Treatment Plant; Distributing Treated Water; Collecting Wastewater; Treating Wastewater; Primary Treatment; Secondary Treatment; Tertiary Treatment

Objectives

- Explain the differences between a confined aquifer and an unconfined one.
- Tell why it is necessary to treat water for drinking and for manufacturing purposes.
- Describe the treatment processes of sedimentation and coagulation.
- Describe how a system for the distribution of treated water operates.
- Tell what takes place during the primary treatment of wastewater.

Lesson 3: Physical Properties of Water

Topics

Basic Properties of Water; The Color of Water; Measuring Water Color; Taste and Odor of Water; The Temperature of Water; Solids in Water; Total Solids in Water; Volatile and Fixed Solids; Turbidity and Suspended Matter; Electrical Conductivity; Measuring Conductivity

Objectives

- Distinguish between the apparent color and the true color of water.
- Name the four basic tastes of water that a person can sense.
- Tell how a rise in temperature affects the various properties of water.
- Name the sources of organic and inorganic solids that pollute wastewater.
- Explain the differences between suspended solids and dissolved solids.

Lesson 4: Chemical Properties of Water

Topics

Atoms and Molecules; Acids, Bases, and Salts; The Ionization of Water; Alkalinity; Acidity; Hardness of Water; Other Unwanted Chemicals; Dissolved Oxygen

Objectives

- Identify the particles in an atom, and tell how they fit together to form the atom.
- Describe the relationship between a pH number and the concentration of H+ ions.
- Name the two color tests for alkalinity of water and tell what colors they produce.
- Describe the ion exchange and lime-soda processes for removing hardness from water.
- Tell why a certain amount of dissolved oxygen (DO) is necessary in surface water.

Lesson 5: Biological Properties of Water

Topics

Pathogenicity; Disinfection; Stabilization of Organic Matter; Biochemical Oxygen Demand; Factors Affecting Growth; The Food Chain; Types of Living Things; Bacteria; Environmental Classifications of Bacteria; Bacteria in Treatment Plants; Viruses; Algae; Protozoa; Higher Organisms

Objectives

- List the methods commonly used to disinfect water.
- Tell how temperature changes affect the rate at which living organisms grow in water.
- Tell how—and how rapidly—common bacteria reproduce.
- List the most effective methods used to inactivate viruses.
- Explain how the presence of algae speeds the process of eutrophication.