

## **Advanced Wastewater Course Listings**

PROVIDER: SACRAMENTO STATE - OFFICE OF WATER PROGRAMS

**Registration:** [www.owp.csus.edu](http://www.owp.csus.edu)

Email: [wateroffice@owp.csus.edu](mailto:wateroffice@owp.csus.edu) Phone: (916) 278-6142

### **Course Title: Advanced Waste Treatment**

**Note:** This training manual was retired and no new editions will be produced. Course enrollments will be available until March 31, 2025.

This correspondence course is designed to train operators to safely and effectively operate advanced wastewater treatment plants. Information presented includes detailed descriptions of the equipment and advanced treatment processes used for odor control, pure oxygen activated sludge treatment, solids removal from secondary effluents, residual solids management, enhanced biological control including nitrogen and phosphorus removal, and wastewater reclamation.

**Format:** Correspondence

**Length:** 90 hours – 2 advanced points

### **Course Title: Industrial Waste Treatment, Vol.1**

This correspondence course is designed to train operators in the practical aspects of operating and maintaining industrial wastewater treatment plants, emphasizing safe practices and procedures. Operators learn to operate and maintain flow measurement equipment, preliminary treatment processes (equalization, screening, and pH adjustment), physical-chemical treatment processes (coagulation, flocculation, and sedimentation), pressure and gravity filters (including membrane filters), physical treatment processes (air stripping and carbon adsorption), and processes for treatment of metal waste streams.

**Format:** Correspondence

**Length:** 90 hours – 2 advanced points

### **Course Title: Industrial Waste Treatment, Vol. 2**

This correspondence course is designed to train operators in the practical aspects of operating and maintaining industrial wastewater treatment plants, emphasizing safe practices and procedures. Topics

covered include the importance and responsibilities of an industrial treatment plant operator, fixed growth processes (trickling filters and rotating biological contactors), activated sludge process control, sequencing batch reactors, enhanced biological treatment (including nitrogen and phosphorus removal), anaerobic treatment, residual solids management, and plant and equipment maintenance.

**Format:** Correspondence

**Length:** 90 hours – 2 advanced points

**Course Title: Pretreatment Facility Inspection**

The purpose of this correspondence course is to train operators to become pretreatment facility inspectors and to improve the knowledge and skills of current inspectors. Topics covered include development and application of regulations, sources of industrial wastewater, source control processes and procedures, monitoring wastewater flows, and collecting and transporting representative samples.

**Format:** Correspondence

**Length:** 75 hours – 1 ½ advanced points

**Course Title: Treatment of Metal Waste streams**

This correspondence course is designed to train operators in the practical aspects of operating and maintaining treatment plants that receive wastewater from electroplating, metal finishing, and printed circuit board manufacturing facilities. Information is presented on the need for treatment of metal waste streams, sources of wastewater, safety data sheets (SDSs), and the globally harmonized system of classification and labeling of chemicals (GHS).

**Format:** Correspondence

**Length:** 45 hours – 1 advanced point

**Course Title: Collection Systems: Methods for Evaluating and Improving Performance**

This correspondence course can assist collection system agencies in evaluating the adequacy and effectiveness of their O&M program and identifying areas where improvements could be made.

**Format:** Correspondence

**Length:** 30 hours – 1/2 advanced points

**PROVIDER: GATEWAY TECHNICAL COLLEGE**

**Registration:** <https://www.gtc.edu/student-services/registrar/registration-information>

Email: [schuckm@gtc.edu](mailto:schuckm@gtc.edu) Phone: (262)353-8500

**Course Title: 607-182 Sampling and Testing**

This course presents a variety of sampling and testing methods required by federal and state regulations for wastewater, groundwater and surface water. Sampling and testing methods and equipment are introduced including:

- Use of automatic samplers
- Flow measurement techniques (open channel, closed pipe, volumetric, dilution)
- Field testing (pH, temperature, dissolved oxygen, chlorine, etc.)
- Sample preservation and storage

Principles of safety related to sampling and testing such as confined space entry, personal protective equipment (PPE) and chemical handling will be presented.

**Format:** Online and Classroom

**Length:** 45 hours – 1 advanced point

**Course Title: 607-185 Waste Water Treatment**

This course reviews waste water characteristics, receiving water and effluent standards. Basic design methodology and operational features of common physical, chemical and biological processes for the treatment of municipal and industrial waste water. In addition the course will provide an introduction to waste water collection systems (sewers), pumps and the processing and disposal of sludges and other treatment plant residues. Will provide the operator with an understanding of how industrial wastewater discharges can affect POTWs. This course includes hands-on training with treatment of industrial waste water (e.g. jar testing and system design). In addition the treatment of a broad spectrum of industrial and municipal wastewater discharges will be covered.

**Format:** Online and Classroom

**Length:** 60 hours – 1 ½ advanced points

**Registration:** <https://www.gtc.edu/student-services/registrar/registration-information>

**Course Title: 607-154 Sewer and Water Systems**

Using the latest hydraulic software, students will learn the basic applications of hydrology and hydraulics for various applications including run off calculations and design of culverts, storm sewers, detention basins, etc. Students will also be acquainted with the principles and software applications in designing water and sewer lines. Course covers the equations and principles for designing and evaluating the performance of sanitary sewers, storm sewers, culverts and detention basins. Students design/verify the design of various sanitary and storm sewers.

**Format:** Online and Classroom

**Length:** 30 hours – 1/2 advanced point

**Course Title: 527-511 Water Chemistry**

**Provider:** Gateway Technical College

Explores basic chemical concepts and principles such as elements, compounds, states of matter, and reactions that are applicable to evaluating and regulating water quality and applies them to water and wastewater treatment. Learners also examine laboratory techniques, equipment, quality assurance, and record keeping and reporting.

**Format:** Classroom

**Length:** 72 hours – 1 ½ advanced points

**PROVIDER: MORAINES PARK TECHNICAL COLLEGE**

**Registration:** [www.morainepark.edu/academics/programs/water-quality-technology/](http://www.morainepark.edu/academics/programs/water-quality-technology/)

Phone: (800)472-4554

**Course Title: Advanced Wastewater Treatment Processes**

Develops competence in management of wastewater treatment processes including disinfection treatment of wastewater, basic and advanced phosphorus removal, tertiary filtration, mechanical sludge handling, sludge dewatering, and sludge disposal. Use the Internet to locate resources useful in managing wastewater treatment processes.

**Format:** Online

**Length:** 72 hours – 1 ½ advanced points

**Course Title: Conventional Wastewater Treatment**

Covers the basic biology, chemistry and operational controls of wastewater treatment processes: pre- and primary treatment of wastewater, activated sludge, trickling filters and RBCs (Rotating Biological Contactors). The structure and function of major equipment is explained. Various lab tests and the calculations associated with them are presented.

**Format:** Online

**Length:** 54 hours – 1 advanced point

**Course Title: Equipment Maintenance and Instrumentation**

Develops skills in the identification and application of tools, correcting facility and system mechanical problems, and understanding the complete concept of preventative and predictive maintenance. Students will research preventative and predictive maintenance systems. Skills will be developed using instrumentation for process control. Supervisory Control and Data Acquisition (SCADA), including control diagrams, designs and applications will be studied.

**Format:** Online

**Length:** 72 hours – 1 ½ advanced points

**Course Title: Hydraulics of Water and Wastewater**

Provides information and procedures necessary to predict and manipulate the hydraulics of water transmission and collection. The primary work assignments involve the reading and use of hydraulic principles and then applying them in a real-life case analysis as a laboratory project.

**Format:** Online

**Length:** 54 hours – 1 advanced point

**Course Title: Industrial Wastes**

Focuses on the control of wastewater resulting from the processing of a variety of industrial materials. Methods of waste initiation; impact; minimization; and the treatment of waste process streams of metal, pulp and paper, and food and beverage industry operations are emphasized and analyzed.

**Format:** Online

**Length:** 54 hours – 1 advanced point

**Course Title: Utility Management**

**Provider:** Moraine Park Technical College

Provides students, utility and industry personnel with concepts and insight into management practices. Fundamentals of managing people in the workplace, budgeting and financial management, legal issues, communication, utility functions, and public relations will be explored. Examining an actual management team and utility will be a part of the student's learning experience during the progression through the course competencies.

**Format:** Online

**Length:** 54 hours – 1 advanced point

**Course Title: Water Chemistry**

**Provider:** Moraine Park Technical College

Explores basic chemical concepts and principles such as elements, compounds, states of matter, and reactions that are applicable to evaluating and regulating water quality and applies them to water and wastewater treatment. Learners also examine laboratory techniques, equipment, quality assurance, and record keeping and reporting.

**Format:** Online

**Length:** 72 hours – 1 ½ advanced points