Water and Wastewater Technology

(For Tutoring-See "Counseling")

Program Description

A study of the principles of water and wastewater disposal and purification including municipal and industrial wastewater collection and treatment. The program will satisfy most of the requirements for certification of water and wastewater treatment personnel.

Certificate of Achievement and Associate in Science

The Associate in Science Degree can be obtained upon completion of 60 units, including the major, the general education requirements, and electives. All courses for this major must be completed with a grade of C or better or a P if the course is taken on a pass-no pass basis.

Program Outcomes

Students who complete the Certificate of Achievement/Associate Degree will be able to:
1. Satisfy the requirements of certification of water and wastewater treatment operators.
2. Meet current industry standards.

Required Core Courses . . . . . Units
WATR 100 Wastewater Treatment I 4
WATR 101 Basic Chemistry for Water and Wastewater . . 4
or
WATR 102 Sanitary Chemistry 4
WATR 104 Water Treatment I 3
WATR 106 Instrumentation and Controls. 3
WATR 107 Mathematics of Water
and Wastewater Treatment 4

Specialty Courses-Select 4 or 5 Units
WATR 105 Wastewater Treatment II 3
WATR 108 Water Treatment II 2
WATR 120 Distribution Systems Maintenance 2
WATR 121 Collection Systems Maintenance 2

Select from the following options:
OPTION 1
BIOT 160 Basic Concepts/Methods in Biotechnology . . . 4
OPTION 2
BIO 014 Principles of Microbiology 4
CHEM 010 Intermediate Chemistry 4
or
CHEM 051 Chemistry for the Health Sciences. 5
or
CHEM 001 General Chemistry 5
OPTION 3
WATR 103 Biological Principles of
Water and Wastewater 3
Total Units 25-32

WATR 100 **4.0 Units**
Wastewater Treatment I
Course Advisories: SCC minimum English and math standards. Study of municipal and industrial wastewater collection and wastewater treatment methods, protection of ground water and receiving waters, and effects of pollutants on receiving waters. ***Four hours lecture***.

WATR 101 **4.0 Units**
Basic Chemistry for Water and Wastewater
Course Advisories: SCC minimum English and Math standards.Through lecture and demonstrations, the student will develop the ability to analyze and determine if proper levels of purification, content of acidity, alkalinity, hardness, and other water quality criteria have been achieved for water or wastewater treatment. ***Four hours lecture***.

WATR 102 **4.0 Units**
Sanitary Chemistry
Prerequisite: CHEM 160 with a grade of "C" or better. Course Advisories: SCC minimum English and math standards. Study of the theory and demonstration of laboratory techniques for control tests of water purification. Emphasis is placed on process control including pH, chlorine residual, coliform, turbidity, BOD, solids, and interpretation of lab test results. Mandatory field trips will be taken to water treatment plants and water quality laboratories. ***Four hours lecture***.

WATR 103 **3.0 Units**
Biological Principles of Water and Wastewater
Course Advisories: SCC minimum English and math standards. This course examines the biological and ecological properties of the bacteria, protozoa, fungi, algae, viruses, and animals whose control is important to the provision of safe drinking water supplies and environmentally safe wastewater. The course emphasizes the microbiology of drinking water, wastewater, and activated sludge, and examines the microbial sampling, analysis, and treatment strategies important in this industry. ***Three hours lecture.***

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WATR 104 **3.0 Units**
Water Treatment I
Course Advisories: SCC minimum English and math standards. This course examines the elementary engineering aspects of the design, operation, process control, and facilities of a plant designed to treat and purify drinking water. ***Three hours lecture.***

WATR 105 **3.0 Units**
Wastewater Treatment II
Prerequisite: WATR 100. Course Advisories: SCC minimum English and math standards. Study of the elementary engineering aspects of design, operation process control, and maintenance of wastewater treatment plants and facilities. ***Three hours lecture.***

WATR 106 **3.0 Units**
Instrumentation and Control
Course Advisories: SCC minimum English and math standards. Study of pneumatic, mechanical and electronic control systems and components. Includes a basic description and explanation of the operation of instruments and controls for water and wastewater plants. Typical performance characteristics, accuracy, and applications of instruments are studied. ***Three hours lecture.***

WATR 107 **4.0 Units**
Mathematics of Water and Wastewater Treatment
Course Advisories: SCC minimum English and math standards. A study of calculations - hydraulics, chemicals, solids - used in the design, operation, process control, and maintenance of treatment plants and facilities. ***Four hours lecture***.

WATR 108 **3.0 Units**
Water Treatment II
Prerequisite: WATR 104 with a minimum grade of C, Course Advisories: SCC minimum English and Math standards. This course covers advanced topics in the control of ions and disinfecting chemicals in drinking water. In addition it covers the issues of safety, regulation, administration, and maintenance of a water treatment plant. This course will often be taught at an off-campus site. ***Three hours lecture.***

WATR 112 **2.0 Units**
Wastewater Treatment III
Prerequisite: WATR 105. Course Advisories: SCC minimum English and Math standards. This course will cover advanced topics appropriate to a wastewater treatment facility including activated sludge, residual solids management, solids removal from secondary effluents, phosphorus and nitrogen removal, enhanced biological (nutrient) control, wastewater reclamation and recycling, and odor control. This course is often taught off-site. ***Two hours lecture***.

WATR 120 **2.0 Units**
Distribution Systems Maintenance
Course Advisories: SCC minimum English and math standards. Study of the operation and maintenance of water distribution systems covering the design, construction and the functioning of these systems. ***Two hours lecture.***

WATR 121 **2.0 Units**
Collection Systems Maintenance
Course Advisories: SCC minimum English and math standards. Study of the operation and maintenance of wastewater collection systems covering the design, construction and functioning of these systems. ***Two hours lecture.***

WATR 125 **2.5 Units**
Water Conservation
Course Advisory: SCC minimum English and Math Standards. Water conservation includes the study of methods to reduce water use, loss, and waste, and methods to increase water efficiency in an effort to minimize the amount of water used to accomplish a function or task. This course combines subject matter lectures and planned learning experiences so students learn the principles involved in the conservation and efficient use of water resources for economic, environmental, and regulatory purposes. Students will learn about water supply and demand, utility water demand characteristics and water rates, residential, commercial, and landscape water use measurements, water management planning, and how to perform various types of water audits.

WATR Special Topics
These courses, numbered 048, 098, or 148 depending upon their transferability, are courses of contemporary interest centered on changing knowledge and important issues in the field. Announcements of Special Topics courses appear in the Schedule of Classes.