

**CUYAMACA COLLEGE**  
**COURSE OUTLINE OF RECORD**

**ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT 210 – INDUSTRIAL WASTEWATER AND STORMWATER MANAGEMENT**

4 hours lecture, 4 units

**Catalog Description**

Overview of water/wastewater regulations with an emphasis on federal, state and local regulatory standards. Integrated study of the principles of wastewater and stormwater management including hydrology, water distribution, wastewater collection, stormwater management, and overall safe drinking water issues.

**Prerequisite**

None

**Course Content**

- 1) Water Laws and Regulations Historical Prospective
  - a. Water Allocation Law
  - b. Refuse Act
  - c. Marine Protection, Research and Sanctuaries Act
  - d. Clean Water Act
  - e. Safe Drinking Water Act
- 2) Federal Water Agencies
  - a. U.S. Army Corp of Engineers (USACE)
  - b. U.S. Bureau of Reclamation (USBR)
  - c. U.S. Fish and Wildlife Service (USFWG)
  - d. Bureau of Land Management
  - e. Environmental Protection Agency
  - f. Natural Resources Conservation Service (NRCS)
  - g. Federal Energy Regulatory Commission (FERC)
  - h. Regional Water Quality Resource Control Board
- 3) Local, Regional, State Water Agencies
  - a. State Water Resources Control Board (California)
  - b. Metropolitan Wastewater Department
  - c. Department of Environmental Health
- 4) Water Quality Management
  - a. Water Pollution
    1. Point Source Pollution
    2. Nonpoint Source Pollution
  - b. Inorganic Chemicals
    1. Metals
    2. Minerals
  - c. Organic Chemicals
    1. Natural Organic Chemicals

2. Synthetic Organic Chemicals
  3. Pesticides
  4. Nutrients
  5. Nitrogen Cycle
  6. The Phosphorus Cycle
  7. Eutrophication
  - d. Waterborne Diseases
  - e. Watershed Protection Program
  - f. Stormwater Management
    1. Program Requirements
    2. Written Program
    3. Inspections
    4. Phase One - Nonpoint source identification
    5. Phase Two - Point source identification
  - g. Wastewater Discharge Requirements
    1. Quantitative Measurement Limitations
    2. Testing
    3. Permitting
- 5) Drinking Water Treatment
- a. Clarification
  - b. Coagulation/Flocculation
  - c. Aeration
  - d. Softening
  - e. Filtration
  - f. Disinfections
  - g. Sludge Treatment
- 6) Wastewater Treatment
- a. Waste Treatment Plant Design
  - b. Preliminary Treatment
  - c. Primary Treatment
  - d. Advance Primary Treatment
  - e. Secondary Treatment
  - f. Fixed Filter Processes
  - g. Trickling Filters
  - h. Biological
  - i. Activated Growth Processes
  - j. Sludge Characteristics
  - k. Sludge Discharge
- 7) Water Use Minimization
- a. Wastewater Reuse/Minimization
  - b. Recycled Water Usage

### **Course Objectives**

Students will be able to:

- 1) Explain the characteristics of water pollutants as it relates to the quality of water.
- 2) Describe wastewater generator discharge requirements and limitations.
- 3) Identify drinking water specifications for human consumption.
- 4) Apply appropriate terms common to the water/wastewater industry.
- 5) Compare and contrast federal, state and local water/wastewater laws.

- 6) Describe the services and functions of agencies that regulate water/wastewater quality and compliance.
- 7) Explain wastewater treatment processes and procedures.
- 8) Identify stormwater requirements.

**Method of Evaluation**

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Exams and quizzes which measure students' ability to broadly define federal, state and local water/wastewater regulatory standards.
- 2) Problem-solving exercises which measure students' ability to describe water movement and management issues including hydrology, water distribution, wastewater collection, groundwater, surface waters, water pollution, stormwater management, and overall safe drinking water issues.

**Special Materials Required of Student**

None

**Minimum Instructional Facilities**

Smart classroom

**Method of Instruction**

- 1) Lecture and discussion
- 2) Projects

**Out of Class Assignments**

- 1) Reading assignments
- 2) Writing assignments
- 3) Projects
- 4) Reports

**Texts and References**

- 1) Required (representative example): Farooqi, I., Kahn, S. (2023). *Management of Wastewater and Sludge New Approaches*. CRC Press. ISBN 9781032064635.
- 2) Supplemental: None

**Student Learning Outcomes**

Upon successful completion of this course, students will be able to:

- 1) Explain the characteristics of water pollutants as they relate to the quality of water.
- 2) Describe wastewater and drinking water requirements and limitations.
- 3) Apply appropriate terms common to the water/wastewater industry.
- 4) Describe the services and functions of agencies that regulate storm water, water/wastewater quality and compliance.