

I. COURSE INFORMATION:

- A. Division: Technical
- Department: Water Supply Technology
- Course ID: WST 146
- Course Title: Wastewater Treatment Operations I
- Units: 3
- Lecture: 3 hours
- Laboratory: None
- Prerequisite: None
- Corequisite: None
- Dept. Advisory: None

B. Catalog and Schedule Description:

Fundamentals of treatment plants including arithmetic, basic chemistry and biology, treatment and disposal methods and plant operations. Underlying principles, unit processors, available equipment and most commonly used current wastewater treatment processes. Prepares students for State Certification examinations for Grade I and Grade II operator certificate.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

III. EXPECTED OUTCOMES:

Upon successful completion of the course, the student should be able to:

- A. Define, discuss and explain the physical, chemical and biological aspects of wastewater treatment.
- B. Identify, distinguish and explain the laboratory procedures to wastewater processes.
- C. Define and discuss how wastewater workers are protectors of the environment.
- D. Define and discuss the physical and mechanical functions of a wastewater treatment plant.
- E. Demonstrate and apply basic mathematical concepts to problem solving in wastewater treatment.
- F. Define and discuss Safety Laws, regulations and practices in the wastewater industries.
- G. Understand the employment requirements and opportunities within the wastewater industries.

IV. COURSE CONTENT:

- A. The Wastewater Treatment Operator
 - 1. Responsibilities and job duties
 - 2. Certification requirements
- B. Wastewater Sources and Treatment
 - 1. Detailed analysis of wastewater sources
 - 2. Water rights
 - 3. Hydrologic cycle
 - 4. Surface water supplies
- C. Wastewater Facilities
 - 1. Types of treatment plants
 - 2. Flows associated with population and industry
- D. Water Quality
 - 1. An overview of the NPDES permits system
 - 2. Limitation of effluent requirements
- E. Disinfection
 - 1. Various aids used to disinfect wastewater effluents
 - 2. Their effects on receiving waters
- F. Treatment Systems
 - 1. The factors in wastewater treatment plants and collection systems

- G. Personal Safety
 - 1. The importance of safe procedures, operator planning, organization
 - 2. The application of safe practices around the work site
- H. Mathematics
 - 1. Common work problems in the wastewater field
- I. Laboratory Procedures
 - 1. Safe lab practices
 - 2. Laboratory sampling
 - 3. Preservation techniques
- J. Job Opportunities for Certified Operators
 - 1. Certification requirements
 - 2. Job classifications
 - 3. Entry level opportunities

V. METHODS OF INSTRUCTION: (Please check all that apply and add any additional not listed.)

- Lecture
- Class and/or small group discussion
- Critical evaluation of texts, newspapers, journal articles, and other printed research
- Critical evaluation of films, videotapes, audiotapes, or other media forms
- Classroom demonstrations
- Field trips
- Guest speakers
- _____ Other:
- _____ Other:
- _____ Other:

VI. TYPICAL OUT-OF-CLASS ASSIGNMENTS:

- A. Reading Assignment. Reading assignments are required and may include (but are not limited to) the following: Read one chapter of the text per week – review objective questions at the end of each chapter.
- B. Writing Assignment. Writing assignments are required and may include (but are not limited to) the following: Write a two-page summary of the observations that you made during the first field trip.
- C. Critical Thinking Assignment. Critical thinking assignments are required and may include (but are not limited to) the following: Write a two-page report on suggestions to enhance the operations you observed during the second field trip.

VII. EVALUATION:

A student's grade will be based on multiple measures of performance and will reflect the objectives explained above. A final grade of "C" or better should indicate that the student has the ability to successfully apply the principles and techniques taught in this course. These evaluation methods may include, but are not limited to, the following (Please check all that apply, and add additional ones not listed):

- _____ Portfolios
- Projects
- Written papers or reports
- Presentations (oral and visual)
- _____ Work performance (internships or field work)
- _____ Lab work
- Comprehensive examinations (cumulative finals or certifications)
- _____ Peer evaluation
- _____ Self evaluation
- Classroom participation
- Homework
- _____ Other:

_____ Other:
_____ Other:

VIII. TYPICAL TEXTS:

- A. Kerri, K., Operation of Wastewater Treatment Plants, Volume 1, 5th Edition, California State University, Sacramento, 2003
- B. Kerri, K., Operation of Wastewater Treatment Plants, Volume 2, 5th Edition, California State University, Sacramento, 2003
- C. Wastewater Engineering Treatment and Reuse, American Water Works Association, 2003

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

Scientific calculator