

I. COURSE INFORMATION:

- A. Division: Technical
- Department: Water Supply Technology
- Course ID: WST 147
- Course Title: Wastewater Treatment Operations II
- Units: 3
- Lecture: 3 hours
- Laboratory: None
- Prerequisite: WST 146
- Corequisite: None
- Dept. Advisory: None

- B. Catalog and Schedule Description: In-depth review of the operation of wastewater treatment facilities with emphasis on how the municipal water treatment plant works to protect the environment and the health and welfare of the community. Prepares students for the State of California Examinations for Grade III and IV 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. Analyze, identify, distinguish and explain the operations of wastewater treatment and how it protects the environment.
- C. Define and discuss social responsibilities of a wastewater treatment plant operator.
- D. Define and discuss the physical and mechanical functions of a wastewater treatment plant.
- E. Demonstrate and apply advanced 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 plant operator
 - 1. Review of responsibilities and job duties
 - 2. Review of Certification requirements
- B. Wastewater sources and treatment
 - 1. Advanced analysis of wastewater sources
 - 2. Collection systems
 - 3. Types of sewers
- C. Sources of biochemical oxygen demand and suspended solids loading on the treatment plant
 - 1. Effluent and receiving water limitations
- D. Preliminary treatments
 - 1. Preliminary treatment methods
 - 2. Grit
 - 3. Screenings
 - 4. Disposal methods
- E. Water quality
 - 1. Public Health standards
 - 2. Types of contaminants
 - 3. Identification and control of parasites

- 4. Toxic materials
- F. Disinfection
 - 1. Chemicals
 - 2. Their properties
 - 3. Safe handling techniques
- G. Treatment systems
 - 1. The different processes
 - 2. Their application
- H. Personal safety
 - 1. Procedures
 - 2. Organization
 - 3. Applications
- I. Mathematics
 - 1. Hydraulics and algebra
 - 2. Application problems
- J. Laboratory procedures
 - 1. Safe lab practices
 - 2. Laboratory sampling
 - 3. Preservation techniques
- K. Job opportunities for Certified Operators
 - 1. Certification requirements
 - 2. Staff levels and entry-level opportunities
- L. Water quality
 - 1. Public Health Standards
 - 2. NPDES permit requirements

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 2, 5th Edition, California State University, Sacramento, 2003
- B. Title 23, California Code of Regulations, Division 3, Chapter 26, Section 3670 et. Seq
- C. Wastewater Engineering Treatment and Reuse, American Water Works Association, 2003

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

Scientific calculator

**PREREQUISITE/COREQUISITE/ADVISORY
COURSE GRID FORM**

Target Course: WST 147 Wastewater Treatment Operations II

Prerequisite Course: WST 146 Wastewater Treatment Operations I

Instructions:

- 1) List exit competencies (skills) from Prerequisite Course. These skills are listed in the "Student Outcomes" section of the Course Outline ("upon completion of the course, the student should be able to...")
- 2) Indicate which of the listed exit competencies (skills) are necessary entry skills needed for success in the target course. Mark with an "X" each needed skill.
- 3) Indicate the degree of importance of each needed entry skill for course success, using the following rating scale:

1=Critical 2=Very Helpful 3=Desirable

Skills Analysis

Entry Skills in Target Course	Exit Skills Provided by Prerequisite Course (Mark with an X if needed and indicate Prerequisite Course if more than one).	Degree of Importance (Rate 1 – 3)
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1. Define, discuss and explain the physical, chemical and biological aspects of wastewater treatment.	X	1
2. Identify, distinguish and explain the laboratory procedures to wastewater processes.	X	1
3. Define and discuss how wastewater workers are protectors of the environment.	X	1
4. Define and discuss the physical and mechanical functions of a wastewater treatment plant.	X	1
5. Demonstrate and apply basic mathematical concepts to problem solving in wastewater treatment.	X	1
6. Define and discuss Safety Laws, regulations and practices in the wastewater industries.	X	1
7. Eligible to take an Operator Certification Exam administered by the State of California Water Resources Control Board.	X	1
8. Understand the employment requirements and opportunities within the wastewater industries.	X	1