

I. COURSE INFORMATION:

- A. Division: Technical
- Department: Water Supply Technology
- Course ID: WST 142x2
- Course Title: Water Quality and Basic Domestic Water Treatment
- Units: 3
- Lecture: 3 hours
- Laboratory: None
- Prerequisite: None
- Corequisite: None
- Dept. Advisory: None

- B. Catalog and Schedule Description: Basic knowledge of water quality and domestic water treatment theory and practice. Prepares students for California State Certification Examinations for Grade I and II Operator's Level.

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

III. EXPECTED OUTCOMES:

Upon successful completion of the **first** semester, the student should be able to:

- A. Define, discuss and explain the physical, chemical and biological aspects of water treatment and production.
- B. Analyze, identify, distinguish and explain the harmonies and relationship between earth and water.
- C. Define and discuss social responsibilities of a water production worker.
- D. Define and discuss the physical and mechanical functions of a water treatment system.
- E. Demonstrate and apply basic mathematical concepts to problem solving in water treatment.
- F. Define and discuss Safety Laws, regulations and practices in the water industries.
- G. Understand the employment requirements and opportunities within the water industries.

Upon successful completion of the **Second** semester, the student should be able to:

- A. Outline the procedures of a sanitary survey.
- B. Evaluate the suitability of a water source for drinking purposes.
- C. Understand most recently implemented water regulations.
- D. Describe the various types of potable water filters and how they work.
- E. Demonstrate proficiency in most current mathematical concepts to problem solving in water treatment.
- F. Define and discuss most recent Safety Laws, regulations and practices in the water industries.
- G. Be eligible to renew Water Treatment Operator Certificate.

IV. COURSE CONTENT:

- A. Water Sources and Treatment
 - 1. The Hydrologic Cycle
 - 2. Reservoir Management
 - 3. Use of Reservoirs for Domestic Water
- B. Water Quality I
 - 1. An Overview of Public Health Standards
 - 2. Types of Contaminants
 - 3. Control of Parasites and Toxic Materials in the Water System
- C. Coagulation and Flocculation
 - 1. Coagulants
 - 2. Alkalinity
 - 3. Temperature and Ph

- D. Sedimentation
 - 1. Treatment Systems
 - 2. Personal Safety
- E. Filtration
 - 1. Filter Media
 - 2. Filtration Rate of Flow
 - 3. Air Binding
 - 4. Turbidity Break Through
- F. Laboratory Procedures
 - 1. A Discussion on Safe Lab Practices
 - 2. Laboratory Sampling and Preservation Techniques

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 Manual of Instruction for Water Treatment Plant Operators and Water Treatment Plant Operation per week. Review questions at the end of each chapter.
- B. Writing Assignment. Writing assignments are required and may include (but are not limited to) the following: Written homework assigned each week from the questions and problems in each chapter.
Typical Questions:
 - 1. Explain the physical, chemical and biological aspects of water treatment and production.
 - 2. Explain the harmonies and relationship between earth and water.
- C. Critical Thinking Assignment. Critical thinking assignments are required and may include (but are not limited to) the following: Complete a two-page summary of what you have observed on the field trips. What could you suggest to make improvements to the various processes?

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. Manual of Instruction for Water Treatment Plant Operators, American Water Works Association, 2003
- B. Water Treatment Plant Operation, 4th Edition, California State University, Sacramento, 2002
- C. Pizzi, Nicholas G., Water Treatment Operator Handbook, American Water Works Association, 2002

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

Calculator