

I. COURSE INFORMATION:

A. Division: Technical
Department: Water Supply Technology
Course ID: WST 143
Course Title: Advanced Domestic Water Treatment
Units: 3
Lecture: 3 hours
Laboratory: None
Prerequisite: WST 142x2
Corequisite: None
Dept. Advisory: None

B. Catalog and Schedule Description:

Advanced study of water treatment methods and techniques used to supply water for domestic purposes. Prepares students for California Department of Health Certification as a Water Treatment Operator for Grade Level III and IV.

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 variables between surface and ground water treatment.
- B. Analyze, identify, distinguish and explain the relationship between potable water and non-potable processes.
- C. Define and discuss legal responsibilities of a water production worker.
- D. Define and discuss the physical and mechanical functions of an advanced water treatment facility.
- E. Demonstrate and apply advanced mathematical concepts to problem solving in water treatment.
- F. Define and discuss Safety Laws, regulations and practices in the water industry.
- G. Distinguish between industrial water treatment and potable water treatment.

IV. COURSE CONTENT:

- A. Iron and Manganese Control
 1. Bacterial considerations
 2. Corrosion from pipes
- B. Fluoridation
 1. Drinking water fluoridation programs
 2. Chemical use and application methods
- C. Water Softening
 1. Water hardness factors
 2. Relationship to industry methods and procedures in water softening
 3. Chemistry of hard water
 4. Carbonate and Non-carbonate water hardness
- D. Demineralization
 1. Reverse Osmosis
 2. Demineralized water for industrial applications
- E. Water Quality
 1. An overview of Public Health Standards
 2. Types of contaminants
 3. Identification and control of parasites and toxic materials in the water system

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 chapter on Treatment Systems. Discuss and analyze the factors in water quality degradation in water systems, water mains and storage facilities.
- 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 variables between surface and ground water treatment.
 2. Explain the relationship between potable water and non-potable processes.
- C. Critical Thinking Assignment. Critical thinking assignments are required and may include (but are not limited to) the following: Prepare a two-page paper of a summary of what you observed on the field trips. What can you suggest to make improvements to the process?

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, 2002
- B. Water Treatment Plant Operation, 4th Edition, California State University, Sacramento, 2002
- C. Principles and Practices of Water Supply Operations in Water Treatment, 3rd Edition, American Water Works Association, 2003

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

San Bernardino Valley College
Curriculum Approved: May 2, 2005

Calculator

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

Target Course: WST 143 Advanced Domestic Water Treatment

Prerequisite Course: WST 142x2 Water Quality and Basic Domestic Water Treatment

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)
1. Define, discuss and explain the physical, chemical and biological aspects of water treatment and production.	X	1
2. Analyze, identify, distinguish and explain the harmonies and relationship between earth and water.	X	1
3. Define and discuss social responsibilities of a water production worker.	X	1
4. Define and discuss the physical and mechanical functions of a water treatment system.	X	1
5. Demonstrate and apply basic mathematical concepts to problem solving in water treatment.	X	1
6. Define and discuss Safety Laws, regulations and practices in the water industries.	X	1
7. Eligible to take an Operator Certification Exam administered by the California Department of Health Services.	X	1
8. Understand the employment requirements and opportunities within the water industries.	X	1