

San Bernardino Valley College
Curriculum Approved: 10/25/2010
Board Approval: 12/09/2010
Unique course Identification Number:
TOP Code: 0000.00 -

I. CATALOG DESCRIPTION:

A. Department Information:

Division: Applied Technology, Transportation & Culinary Arts
Department: WATER SUPPLY TECHNOLOGY
Course ID: WST020
Course Title: Test Review for Water Treatment T1

Departmental Advisory:
WST 071

B. Catalog Description:

This course is a review of the expected Range of Knowledge (ROK) required to obtain the California Department of Public Health (CDPH) Water Treatment Operator License at grade T1. The review topics include conventional treatment techniques, flocculation, sedimentation, filtration, system pressures, and related math.

C. Schedule Description:

This course is a review of the expected Range of Knowledge required for the California Department of Public Health (CDPH) Water Treatment Operator Licenses at grade T1.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. COURSE OBJECTIVES FOR STUDENTS:

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

- A. Identify the expected Range of Knowledge (ROK) required to successfully pass the California Department of Public Health (CDPH) Treatment Operator License examination at the T2 level
- B. Identify reliable sources of information which are likely to contain accurate information about water treatment
- C. Identify what information is needed to successfully pass licensing examination and understand how it is organized to find the best sources of information

IV. COURSE CONTENT:

- A. Operator certification requirements
- B. Water treatment mathematics
- C. Units and conversion factors
- D. Water measurements (metering)
 1. Formulas for area and volume
 2. Calculation of dosage, feed rates and flow rates
 3. Sources of supply
 4. Ground water and surface water
 5. Sanitary hazards for each type of water supply

6. Safeguards in well location and construction
7. Chemical, physical and bacteriological characteristics of water
8. Hydrologic cycle
- E. Disinfection
 1. Purpose of disinfection
 2. Characteristics of chlorine and chlorine compounds
 3. Chlorine demand-significance and variability
 4. Chlorine storage, feeding and measurements
 5. Hazards and safety requirements
- F. Elementary water chemistry
 1. Elements and compounds
 2. Alkalinity, hardness, significance of changes in pH and alkalinity
- G. Water quality parameters
 1. Microbiological
 2. Organic and inorganic
 3. Radiological
- H. Water quality
 1. Drinking water regulations
 2. Maximum contaminant levels
 3. Elements, compounds, hardness and pH
 4. Significance of organic and inorganic contaminants
 5. Lead and copper rule
 6. Public notification
 7. Disinfection-by-products
- I. Microbiological and chemical quality
 1. Bacteria, viruses and protozoan
 2. Coliform group - occurrences, significance
 3. Pathogenic diseases
 4. Monitoring and reporting requirements
- J. System operations
 1. Distribution pipe system - materials, sanitary hazards including cross-connection
 2. Protection, detection, disinfection of new or repaired main, operation and maintenance, sampling
 3. Pump and water pressure - pump characteristics, positive displacement pumps, centrifugal pumps, calculation of pump output
 4. Chemical feeders
 5. Pressure gauges
 6. Electrical generators
- K. Water treatment processes
 1. Corrosion control
 2. Fluoridation
 3. Water softening
- L. Safety
 1. OSHA/Cal-OSHA regulations
 2. Traffic control
 3. Confined spaces

V. METHODS OF INSTRUCTION (May include any, but do not require all, of the following):

- A. Lecture
- B. Use of films, videotapes, or other media
- C. Use of written materials: texts, journals, etc.
- D. Instructor generated handouts

VI. TYPICAL OUT-OF-CLASS ASSIGNMENTS:

- A. Reading assignments are required and may include (but are not limited to) the following:

Read the handouts provided in the class and answer questions on the important provisions of the Safe Drinking Water Act.

- B. Critical thinking assignments are required and may include (but are not limited to) the following:

Calculate the amount of chlorine, in lbs/day (pounds per day), needed to treat 3 MGD (million gallons per day) of water. The chlorine demand is 4.2 mg/L and a residual of 0.3 mg/L is required.

- C. Writing assignments are required and may include (but are not limited to) the following:

List the different types of chemicals used to disinfect water. Explain the advantages and disadvantages of using each chemical in one or two paragraphs.

VII. METHODS OF EVALUATION

- A. Class participation
- B. Presentations (oral or visual)

VIII. TYPICAL TEXT(S):

- A. Christensen, Melissa. Water Treatment. 4th ed. American Water Works Association, 2010.
- B. Kerri, Ken. Water Treatment Plant Operation, Volume II. 5th ed. California State University, 2009.
- C. Kerri, Ken. Water Treatment Plant Operations, Volume 1. 6th ed. California State University, 2010.

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

- A. A Scientific Calculator