

San Bernardino Valley College  
Curriculum Approved: 12/10/2013  
Board Approval: 01/16/2014  
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: WST021  
Course Title: Test Review for Water Treatment T2  
Units: 0.5  
Lecture: 0.5 contact hour(s) per week  
8 - 9 contact hours per semester

### Departmental Advisory:

WST 052

### Prerequisite:

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 II certification. The review topics include conventional treatment techniques, source water supply and storage, water quality regulation and related math.

### **C. Schedule 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 II certification. The review topics include conventional treatment techniques, source water supply and storage, water quality regulation and related math.

## **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 required to successfully pass the CDPH Water Treatment Operator License examination at T2 level

## **IV. COURSE CONTENT:**

- A. Operator certification requirements
- B. Water treatment mathematics
  1. Units and conversion factors
  2. Water measurements (metering)
  3. Formulas for area, volume, flow rates, velocity
  4. Disinfectant dosages
    - a. Dechlorination
    - b. Residual
  5. Calculation of chemical dosages, feed rates, concentrations and dilution factors

- C. Sources of supply
  1. Ground water and surface water
  2. Sanitary hazards for each type of water supply
  3. Safeguards in well location and construction
  4. Chemical, physical and bacteriological characteristics of water
  5. Hydrologic cycle
- D. Disinfection
  1. Purpose of disinfection
  2. Characteristics of chlorine and chlorine compounds
  3. Chlorine demand - significance, variability
  4. Chlorine storage, feeding and measurements
  5. Purpose of dechlorination
  6. Hazards and safety requirements
- E. Elementary water chemistry
  1. Elements and compounds
  2. Alkalinity, hardness, significance of changes in pH and alkalinity
- F. Water quality parameters
  1. Microbiological
  2. Organic and inorganic
  3. Radiological
- G. Water quality
  1. Drinking water regulations
  2. Maximum contaminant levels
  3. Lead and copper rule
  4. Public notification
  5. Microbiological and chemical quality
    - a. Bacteria, viruses and protozoan
    - b. Coliform groups - occurrences, significance
    - c. Waterborne pathogens
  6. Monitoring and sampling requirements
    - a. Sampling plan
    - b. Sample collection
    - c. Reporting requirements
- H. 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
  7. Instrumentation and controls
- I. Water treatment processes
  1. Corrosion control
  2. Health effects of fluoridation
  3. Water softening
  4. Chemicals causing hard water
  5. Best available technology
- J. Safety
  1. Cal-OSHA safety regulations
  2. Lock-out/tag-out
  3. Traffic control
  4. 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:  
Review the handouts provided in class and answer questions on the important provision of the Safe Drinking Water Act.
- B. Critical thinking assignments are required and may include (but are not limited to) the following:  
How many lbs/day (pounds per day) of chlorine is needed to treat 3 MGD of water. The demand is 4.2 mg/L and 0.3 mg/L residual is required.
- C. Writing assignments are required and may include (but are not limited to) the following:  
List the different chemicals used to disinfect water. Write the advantages and disadvantages of using each chemical.

**VII. METHODS OF EVALUATION**

- A. Class participation
- B. Presentations (oral or visual)
- C. Written papers or reports

**VIII. TYPICAL TEXT(S):**

- A. Kerri, Ken. Water Treatment Plant Operation, Volume I. 6th ed. California State University, 2008.
- B. Kerri, Ken. Water Treatment Plant Operation, Volume II. 6th ed. California State University, 2008.

**IX. OTHER SUPPLIES REQUIRED OF STUDENTS:**

- A. Scientific calculator