

San Bernardino Valley College

Curriculum Approved:

Board Approval:

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: WST025

Course Title: Test Review for Wastewater Treatment Plant Operations Grades One and Two

Units: 0.5

Lecture: 0.5 contact hour(s) per week
8 - 9 contact hours per semester

Corequisite:

WST-052 or WST-053

Prerequisite:

WST-091

B. Catalog Description:

This course is a review of the expected Range of Knowledge (ROK) required to obtain the State Water Resources Control Board (SWRCB) Wastewater Treatment Plant Operator certification at the Operator I level. The review topics include distribution system operations, disinfection, related mathematics, and safety.

C. Schedule Description:

This course is a review of the expected Range of Knowledge (ROK) required to obtain the State Water Resources Control Board (SWRCB) Wastewater Treatment Plant Operator certification at the Operator I and II level. The review topics include distribution system operations, disinfection, related mathematics, and safety.

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 SWRCB Wastewater Treatment Operator examination at the Grade I or II level.

IV. COURSE CONTENT:

A. Safety

1. Confined space
2. Lock-out/tag-out procedure
3. Chemical and biological hazards
4. Employee right-to-know laws

B. Wastewater treatment system operator

1. SWRCB requirements for certification
2. Application deadlines, training and education required for licensing

3. Relationship between wastewater treatment and public health
4. Reasons for treating wastewater
- C. Sources
 1. Characteristics
 2. Estimate quantities
 3. Wastewater collection systems and computation of flow in sewers
 4. Flow diagrams of typical treatment processes
- D. Preliminary treatment
 1. Grit removal (aerated and non-aerated)
 2. Screening (comminution)
- E. Primary treatment
 1. Sedimentation and flotation theory
 - a. Removal efficiency
 - b. Hydraulic loading
 - c. Surface overflow rates
 - d. Weir overflow rates
 - e. Tank design configuration: rectangular vs. circular
 - f. Removal of sludge and floatables
- F. Secondary treatment processes
 1. Stabilization ponds
 2. Theory of operation
 - a. Aerobic ponds
 - b. Anaerobic ponds
 - c. Facultative ponds
 3. Hydraulic and organic loadings
 4. Efficiencies
- G. Trickling filters
 1. Theory of operation
 2. Roughing filter
 3. Low and high rate filter
 4. Treatment efficiencies
- H. Activated sludge
 1. Theory of operation
 2. Conventional activated sludge
 3. Applicability to various types of waste
- I. Disinfection Processes
 1. Chlorination
 2. Theory of disinfection
 3. Effluent disinfection
- J. Introduction to tertiary treatment processes
- K. Introduction to solids handling and disposal
- L. Introduction to sampling and simple analysis of wastewater constituents
 1. pH
 2. BOD
 3. Chlorine residual
 4. Dissolved oxygen
 5. Coliform bacteria
- M. Solve wastewater related math problems
 1. Volume and surface areas
 2. Flow and velocity
 3. Overflow rates
 4. Pumping rates
 5. Detention time
 6. Solids concentration
 7. Removal efficiency (percent removal)
 8. Recirculation ratios
 9. Chlorine residual, demand, feed

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 the class and answer questions on the importance of treating wastes and its overall impact on human health.
- B. Critical thinking assignments are required and may include (but are not limited to) the following:
A wastewater treatment pond has an average length of 705 feet with an average width of 450 feet. If the flow rate to the pond is 290,000 gal each day, and is operated at a depth of 5.8 feet, what is the hydraulic detention time in days?
- C. Writing assignments are required and may include (but are not limited to) the following:
Define the major categories of wastewater treatment processes and describe the purpose of each.

VII. METHODS OF EVALUATION

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

VIII. TYPICAL TEXT(S):

- A. Ken Kerri Wastewater Treatment Plant Operations, Volume 1. 7th ed. California State University, 2008.
- B. Price, Joann Kirkpatrick Applied Math for Wastewater Treatment Plant Operators. 1st ed. Technomic Publishing, 1991.

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

- A. A scientific calculator.