

Course Outline

COURSE: WTRM 111 **DIVISION:** 50 **ALSO LISTED AS:**

TERM EFFECTIVE: Spring 2018 **Inactive Course**

SHORT TITLE: ADV WASTEWATER TRT PLT OP

LONG TITLE: Advanced Wastewater Treatment Plant Operation

Units	Number of Weeks		Contact Hours/Week		Total Contact Hours
3	18	Lecture:	3	Lecture:	54
		Lab:	0	Lab:	0
		Other:	0	Other:	0
		Total:	3	Total:	54

COURSE DESCRIPTION:

This course is designed to familiarize students with advanced wastewater treatment systems, including secondary and tertiary treatment, solids handling, disinfection, reclamation of wastewater, as well as laboratory study. The course prepares students for the CSWRB Wastewater Treatment Plant Operator examinations. This course is now listed as WTRM 211. **ADVISORY:** WTRM 101 Introduction to Water/Wastewater Technology; WTRM 107 Beginning Wastewater Treatment Operation.

PREREQUISITES:

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

L - Standard Letter Grade

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

02 - Lecture and/or discussion

STUDENT LEARNING OUTCOMES:

1. Analyze, synthesize, and evaluate wastewater operations in an increasingly complex manner.

Measure of assessment: Reading Assignments, Quiz

Year assessed, or planned year of assessment: Fall 2017

2. Demonstrate competent and efficient plant operations through real-life decision-making examples.

Year assessed, or planned year of assessment: Fall 2017

3. Examine and describe wastewater processes as well as the fundamental concepts of wastewater theory.

Measure of assessment: Reading Assignments, Quiz

Year assessed, or planned year of assessment: Fall 2017

4. Examine and describe wastewater processes as well as the fundamental concepts of wastewater theory.

Measure of assessment: Reading Assignments, Quiz

Year assessed, or planned year of assessment: Fall 2017

5. Interpret and analyze performance calculations for wastewater processes and apply these techniques to real-life situations.

Measure of assessment: Reading Assignments, Take-home assignments

Year assessed, or planned year of assessment: Fall 2017

6. Identify the appropriate process control measures in making sound operational decisions.

Measure of assessment: Reading Assignments, Quiz

Year assessed, or planned year of assessment: Fall 2017

7. Apply control techniques to specific and practical wastewater situations.

Measure of assessment: Reading Assignments, Quiz

Year assessed, or planned year of assessment: Fall 2017

8. Examine wastewater theory in practice through the case studies and analysis of current articles in the media.

Measure of assessment: Written report or term paper

Year assessed, or planned year of assessment: Fall 2017

9. Value the importance and the function of wastewater treatment plant operations in the protection of public health and the environment through applied theory to practice via case studies.

Measure of assessment: Reading Assignments, Quiz

Year assessed, or planned year of assessment: Fall 2017

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS

Inactive Course: 11/13/2017

3 Hours

Content: Wastewater Mathematics Review

Student Performance Objectives (SPO): Utilize basic math principles and formulas as they apply to a wastewater treatment plant. This may include Tank Areas and Volumes, Flow Rates and Velocity, Milligram per Liter to Pounds, Chemical Dosages, Loading Rates, Detention Times and Retention Times, Efficiency and Percent Removal Rates, and Pumping Rates etc.

Out-of-Class Assignments: Taken- home Math assignments

6 Hours

Content: Wastewater Advanced Mathematics

Student Performance Objectives (SPO): Utilize advanced calculation methods, including sludge and digester calculations, wasting rates, fixed solid calculations, etc.

Out-of-Class Assignments: Take-home Math assignments

6 Hours

Content: Activated Sludge (Conventional Activated Sludge Plants)

Student Performance Objectives (SPO): Explain the principles of the activated sludge process; place a new activated sludge process into place; collect samples, interpret lab results, and make adjustments in the treatment process; determine aerator loadings and understand the application of different loading guidelines; describe each of the process stages used to treat wastewater in a sequencing batch reactor (SBR); and review plans and specifications for a sequencing batch reactor.

Out-of-Class Assignments: Read Chapter 11 from Kerri Book

6 Hours

Content: Sludge Digestion and Solids Handling.

Student Performance Objectives (SPO): Explain how a sludge digester works and what factors influence and control the digestion process; recognize factors that indicate sludge digestion processes are not working properly; discuss the various methods of solids handling and know how to maintain and operate these processes; determine loading on sludge digesters and solids handling facilities; and develop an operating strategy for a sludge digester.

Out-of-Class Assignments: Read Chapter 12 from Kerri Book

8 Hours

Content: Effluent Disposal

Student Performance Objectives (SPO): Explain how to properly dispose of plant effluents in receiving waters; develop an operation strategy for effluent disposal; troubleshoot an effluent disposal system; develop a receiving water monitoring plan; conduct an effluent monitoring program; and review plans and specifications for an effluent disposal system.

Out-of-Class Assignments: Read Chapter 13 from Kerri Book - Mid Term Exam

3 Hours

Content: Plant Safety and Good Housekeeping

Student Performance Objectives (SPO): Identify the types of hazards that are in a wastewater treatment plant; recognize unsafe conditions and correct them whenever they develop; organize regular tailgate meetings; and develop the habit of always thinking safety and working safely.

Out-of-Class Assignments: Read Chapter 14 from Kerri Book

3 Hours

Content: Maintenance of Plant Equipment

Student Performance Objectives (SPO): Develop a maintenance plan for a wastewater treatment plant, including equipment, building, grounds, channels, and tanks; schedule maintenance at proper time intervals; troubleshoot equipment; start and stop pumps; unplug pipe pumps and valves; explain the operation and maintenance of sensors, transmitters, receivers, and controllers; and determine when you need assistance to solve a problem.

Out-of-Class Assignments: Read Chapter 15 from Kerri Book

6 Hours

Content: Laboratory Procedures and Chemistry

Student Performance Objectives (SPO): Describe how to work safely in a laboratory environment; operate laboratory equipment; collect representative samples of influents and effluents from a treatment process; prepare samples for analysis; perform plant control tests; analyze plant effluents in accordance with NPDES permit requirements; and record laboratory results.

Out-of-Class Assignments: Read Chapter 16 from Kerri Book

3 Hours

Content: Application of computers for Plant O&M

Student Performance Objectives (SPO): Discuss the use of computers in treatment plants; identify tasks in the treatment plant that could be performed by computers; provide reasons which justify purchasing and using computers; recognize cautions that must be exercised by operators using computers; and evaluate both computer hardware and software.

Out-of-Class Assignments: Read Chapter 17 from Kerri Book

3 Hours

Content: Analysis and Presentation of Data Records and Report Writing

Student Performance Objectives (SPO): Identify causes of variation in results; read manometers, gages, and charts, analyze and present data using charts and graphs, tables, and numbers; calculate arithmetic mean, range, median, mode, geometric mean, moving average, variance, and standard deviation.

Out-of-Class Assignments: Read Chapter 18 from Kerri Book

3 Hours

Content: Records and Report Writing

Student Performance Objectives (SPO): Explain the importance and need for records; identify the different types of records, evaluate records, organize a report; and write a report.

Out-of-Class Assignments: Read Chapter 19 from Kerri Book

2 Hours

METHODS OF INSTRUCTION:

Quizzes: Periodic short objective tests of course-related concepts, such as mathematical theory, procedures or techniques applied to wastewater treatment. Graded assignment/worksheets Mid-term and final exams: A combination of objective questions on important concepts and mathematical problems. Oral presentation demonstrating the student's understanding of an article taken from a trade journal that addresses a wastewater-related topic that exemplifies current discussions or theories, which will be graded. Written term paper or research project. .

METHODS OF EVALUATION:

Writing assignments

Percent of total grade: 15.00 %

Percent range of total grade: 15 % to 35 % Term or Other Papers Other: Project

Problem-solving assignments

Percent of total grade: 10.00 %

Percent range of total grade: 10 % to 50 % Homework Problems Quizzes Exams

Objective examinations

Percent of total grade: 40.00 %

Percent range of total grade: 40 % to 60 % Multiple Choice True/False Other: Math -Show work

Other methods of evaluation

Percent of total grade: 0.00 %

REPRESENTATIVE TEXTBOOKS:

Required Representative Textbooks

Kenneth D. Kerri. Operation of Wastewater Treatment Plants Volume II, 7th Edition, or other appropriate college level text.. California State University, Sacramento: University Enterprises, Inc.,2007.

This text is an important industry standard text and is the most current edition available. This exact textbook is currently being used in the Water Program courses at CSU, Sacramento.

ISBN: 978-1-59371-038-5

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:

CSU GE:

IGETC:

CSU TRANSFER:

Transferable CSU, effective 201230

UC TRANSFER:

Not Transferable

SUPPLEMENTAL DATA:

Basic Skills: N

Classification: Y

Noncredit Category: Y

Cooperative Education:

Program Status: 1 Program Applicable

Special Class Status: N

CAN:

CAN Sequence:

CSU Crosswalk Course Department: WTRM

CSU Crosswalk Course Number: 111

Prior to College Level: Y

Non Credit Enhanced Funding: N

Funding Agency Code: Y

In-Service: N

Occupational Course: C

Maximum Hours: 3

Minimum Hours: 3

Course Control Number: CCC000529236

Sports/Physical Education Course: N

Taxonomy of Program: 095800