GAVILAN COLLEGE
5055 Santa Teresa Blvd
Gilroy, CA 95023

Course Outline

COURSE: WTRM 134 DIVISION: 50 ALSO LISTED AS:

TERM EFFECTIVE: Spring 2018 **Inactive Course**

SHORT TITLE: IND WASTEWATER/STORMWATER MGMT

LONG TITLE: Industrial Wastewater and Stormwater Management

Units	Number of Weeks		Contact Hours/Week		Total Contact Hours
4	18	Lecture:	4	Lecture:	72
		Lab:	0	Lab:	0
		Other:	0	Other:	0
		Total:	4	Total:	72

COURSE DESCRIPTION:

This course is designed to provide an overview of water/ wastewater regulations with an emphasis on local, state, and federal regulatory standards. The study of the principles of wastewater and stormwater management including hydrology, water distribution, wastewater collection, stormwater management, and safe drinking water issues will be covered along with an introduction to the one water management concept. This course is now listed as WTRM 234.

PREREQUISITES:

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES
L - Standard Letter Grade
P - Pass/No Pass

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:
02 - Lecture and/or discussion

STUDENT LEARNING OUTCOMES:
1. Explain the characteristics of water pollutants as it relates to the quality of water.
Measure: written exam
PLO:

ILO: 7,2
GE-LO:
Anticipated Year of Assessment: 2016-17
2. Describe wastewater generator discharge requirements and limitations.
Measure: written exam, discussion
PLO:
ILO: 7,2,1
GE-LO:
Anticipated Year of Assessment: 2016-17
3. Identify drinking water specifications for human consumption.
Measure: written exam, homework, discussion
PLO:
ILO: 7,2,1
GE-LO:
Anticipated Year of Assessment: 2016-17
4. Apply appropriate terms common to the water/wastewater industry.
Measure: exams, homework, discussion
PLO:
ILO: 7,2,1
GE-LO:
Anticipated Year of Assessment: 2016-17
5. Compare and contrast local, state and federal water/wastewater laws.
Measure: written exam, homework
PLO:
ILO: 7,2
GE-LO:
Anticipated Year of Assessment: 2016-17
6. Describe the services and functions of agencies that regulate water/wastewater quality and compliance.
Measure: written exam, homework
PLO:
ILO: 7,2
GE-LO:
Anticipated Year of Assessment: 2016-17
7. Explain wastewater treatment processes and procedures.
Measure: written exam, discussion
PLO:
ILO: 7,2,1
GE-LO:
Anticipated Year of Assessment: 2016-17
8. Explain the hydrologic cycle and how human operations can impede that cycle; including why stormwater regulations are in-place.
Measure: written exam
PLO:
ILO: 7,2
GE-LO:
Anticipated Year of Assessment: 2016-17
9. Discuss the challenge of moving to an integrated water management approach (One Water).

Measure: homework, discussion

PLO:

ILO: 7,2,1,4

GE-LO:

Anticipated Year of Assessment: 2016-17

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

Inactive Course: 11/13/2017

8 Hours

Content: Historical Prospective of Water Laws and Regulations:

Water Allocation Law; Reclamation Act; Refuse Act; Marine Protection, Research and Sanctuaries Act; Clean Water Act; Safe Drinking Water Act

Student Performance Objectives (SPO): Discuss the following water laws/regulations: Water Allocation Law; Reclamation Act; Refuse Act; Marine Protection, Research and Sanctuaries Act; Clean Water Act; and Safe Drinking Water Act.

Out-of-Class Assignments: Read related chapter(s) in the textbook and answer study guide questions. Homework: Write a 1-2 page paper on the history of one of the water laws/regulations presented in class.

8 Hours

Content: Federal Water Agencies:

U.S. Army Corp of Engineers (USACE), U.S. Bureau of Reclamation (USBR), U.S. Fish and Wildlife Service (USFWG), Bureau of Land Management, Environmental Protection Agency,

Natural Resources Conservation Service (NRCS), Federal Energy Regulatory Commission (FERC), Regional Water Quality Resource Control Board

Student Performance Objectives (SPO): Discuss the purpose of each of the federal water agencies presented in class. Distinguish the federal agencies that regulate hazardous materials/waste. Define the federal water/wastewater regulatory standards.

Out-of-Class Assignments: Read related chapter(s) in the textbook and answer study guide questions. Homework: Locate and visit if possible, one of the federal water agencies presented in class. Come prepared to discuss the agency you located and/or visited.

8 Hours

Content: Local, Regional, State Water Agencies:

California State Water Recourses Control Board, County Wastewater Departments, Department of Environmental Health

Student Performance Objectives (SPO): Discuss the purpose of each of the local, regional, and state water agencies presented in class. Define the state and local water/wastewater regulatory standards. Distinguish the various agencies that regulate hazardous materials/waste. Describe appropriate handling and management procedures for hazardous materials/waste.

Out-of-Class Assignments: Read related chapter(s) in the textbook and answer study guide questions. Homework: Locate and visit one of the local, regional, or state water agencies presented in class. Come prepared to discuss the agency you visited.

12 Hours

Content: Water Quality Management:

Water Pollution - Point Source Pollution, Nonpoint Source Pollution; Inorganic Chemicals - Metals, Minerals; Organic Chemicals - Natural Organic Chemicals, Synthetic Organic Chemicals, Pesticides, Nutrients, Nitrogen Cycle, The Phosphorus Cycle, Eutrophication; Waterborne Diseases; Watershed Protection Program; Stormwater Management- Program Requirements, Written Program, Inspections, Phase One - Nonpoint source identification, Phase Two - Point source identification; Wastewater Discharge Requirements - Quantitative Measurement Limitations, Testing, Permitting

Student Performance Objectives (SPO): Recognize and apply appropriate terms common to the industrial wastewater and stormwater management industry. Analyze the criteria of physical, chemical, and biological interactions of pollutants and their effect on industrial wastewater and stormwater management. Explain the latest maintenance and operations methods for water, wastewater, and stormwater systems. State the program requirements for stormwater management. Identify the natural hydrologic cycle and how the 'built'

environment impacts the cycle. Describe the regulations (and the governing agency) that try to mitigate the human impact. List the wastewater discharge requirements.

Out-of-Class Assignments: Read related chapter(s) in the textbook and answer study guide questions. Homework: Select a topic presented in water quality management and prepare a written and oral report.

8 Hours

Content: Drinking Water Treatment:

Clarification, Coagulation/Flocculation, Aeration, Softening, Filtration, Disinfections, Sludge Treatment

Student Performance Objectives (SPO): Recognize and apply appropriate terms common to the industrial wastewater and stormwater management industry. Describe the following drinking water treatment methods: clarification, coagulation/flocculation, aeration, softening, filtration, disinfections, and sludge treatment. Define the best management practices and safe operation procedures used in industrial wastewater and stormwater management.

Out-of-Class Assignments: Read related chapter(s) in the textbook and answer study guide questions. Homework: Write a 1-2 page paper on one of the drinking water treatment methods presented in class. Come prepared to discuss your paper in class.

8 Hours

Content: Wastewater Treatment:

Waste Treatment Plant Design, Preliminary Treatment, Primary Treatment, Advance Primary Treatment, Secondary Treatment, Fixed Filter Processes, Trickling Filters, Biological, Activated Growth Processes, Sludge Characteristics, Sludge Discharge

Student Performance Objectives (SPO): Examine the advances in design and construction methods for waste treatment plants. Identify the best practices in infrastructure management. Explain the preliminary, primary, advance primary and secondary treatment of wastewater as specified by the EPA. State the characteristics of sludge from wastewater. Describe how a trickling filter wastewater treatment system works.

Out-of-Class Assignments: Read related chapter(s) in the textbook and answer study guide questions. Homework: Field Trip to a Wastewater Treatment Plant. Write a 1-2 page paper on the experience and come prepared to discuss your comments with the class.

8 Hours

Content: Water Use Minimization:

Wastewater Reuse/Minimization, Recycled Water Usage

Student Performance Objectives (SPO): Explain how to optimize the operation of water supply systems. Describe methods that can minimize water use. List ways that wastewater can be reused. List ways that recycled water can be used.

Out-of-Class Assignments: Read related chapter(s) in the textbook and answer study guide questions. Homework: Investigate ways that you, your relatives, your neighbors, and/or your local community reuses water and/or recycles water and be prepared to discuss your findings in class.

8 Hours

Content: One Water Management Concept: Water from all sources managed cooperatively to meet economic, social and environmental needs.

Institutional Barriers or Opportunities for Integrated Planning and Management of Water Services, Organizations/Universities Involved in the Process, Next Steps

Student Performance Objectives (SPO): Discuss the One Water Management Concept. Identify the opportunities and constraints with the One Water Management Concept, including how employing this concept can result in triple bottom line results (social, economic and environmental). Name the organizations and universities that recognize this concept.

Out-of-Class Assignments: Read handouts provided and answer study guide questions. Be prepared to discuss the One Water Management Concept in class. Homework: Select a City/County to research with the intent of understanding their operations so they can present a One Water solution for that agency. AND Investigate the various organizations and universities that are employing the One Water Management Concept.

METHODS OF INSTRUCTION:

lecture, discussion, multimedia presentations

METHODS OF EVALUATION:

Category 1 - The types of writing assignments required:
Percent range of total grade: 20 % to 30 %
Written Homework
Category 2 - The problem-solving assignments required:
Percent range of total grade: 10 % to 30 %

Quizzes
Exams

Category 3 - The types of skill demonstrations required:
Percent range of total grade: % to %
Category 4 - The types of objective examinations used in the course:
Percent range of total grade: 50 % to 70 %
Multiple Choice
True/False
Matching Items

REPRESENTATIVE TEXTBOOKS:

Required:

Grigg, Neil S. Water, Wastewater, and Stormwater Infrastructure Management, Second Edition. New York: CRC Press, Taylor & Francis Group, 2012. Or other appropriate college level text.

Reading level of text, Grade: 12th Verified by: MS Word

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:
CSU GE:
IGETC:
CSU TRANSFER:
Transferable CSU, effective 201670
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:
CSU Crosswalk Course Number:
Prior to College Level: Y

Non Credit Enhanced Funding: N
Funding Agency Code: Y
In-Service: N
Occupational Course: C
Maximum Hours: 4
Minimum Hours: 4
Course Control Number: CCC000571981
Sports/Physical Education Course: N
Taxonomy of Program: 095800