

Course Outline

COURSE: WTRM 212 **DIVISION:** 50 **ALSO LISTED AS:** WTRM 112

TERM EFFECTIVE: Fall 2019 **CURRICULUM APPROVAL DATE:** 11/13/2018

SHORT TITLE: APPLIED HYDRAULICS

LONG TITLE: Applied Hydraulics

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:

Study of the hydraulics necessary in the operation of water and maintenance plants and systems. Consideration of the types of pumps used in water/wastewater service, their operational characteristics, required maintenance and the problems common to their use. This course was previously listed as WTRM 112. **ADVISORY:** WTRM 201 Introduction to Water/Wastewater Technology and WTRM 202 Beginning Water/Wastewater Mathematics.

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

05 - Hybrid

72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:

1. Outline and explain the principles of basic hydraulics theory.

Measure of assessment: Homework, Quiz

Year assessed, or planned year of assessment: 2018

Semester: Fall

2. Apply hydraulic theory to practical applications in a water/wastewater environment.

Measure of assessment: Homework, Quiz

Year assessed, or planned year of assessment: 2018

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

Curriculum Approval Date: 11/13/2018

6 Hours

Content: Basic Fluid Principles

Student Performance Objectives: Explain the foundation of fluid principles which support hydraulic theory. Outline and discuss basic fluid principles.

6 Hours

Content: Principles of Basic Hydraulics

Student Performance Objectives: Explain the function and use of hydraulic cylinders.

6 Hours

Content: Centrifugal Pumps, Rotary Pumps, Displacement Pumps, and Special Service Pump Applications

Student Performance Objectives: Explain the construction and operation of different types of pumps used in the water industry. Describe the application and use of centrifugal pumps, rotary pumps, displacement pumps, and special service pumps.

3 Hours

Content: Hydraulic Accumulators

Student Performance Objectives: Describe the different storage devices that store liquid under pressure and explain how liquid stored under pressure can be used to accomplish work. Explain the applications of hydraulic accumulators.

3 Hours

Content: Power Transmission Application of Hydraulics

Student Performance Objectives: Describe fluid drives and liquid drives involving couplings and explain how they work. Describe the power transmission application of hydraulics.

6 Hours

Content: Review for and take Mid-Term Exam, Basic Hydraulic Theory

Student Performance Objectives: Explain the principles and applications of basic hydraulic theory.

3 Hours

Content: Hydraulic Power Tools Used in the Water Industry

Student Performance Objectives: Identify different hydraulic tools with an emphasis on tools used for pipe and appurtenance repairs. List and describe hydraulic power tools used in the water industry.

9 Hours

Content: Control Valves

Student Performance Objectives: Describe the applications of different types of hydraulic and pneumatic control valves used to control water levels. Explain the function and use of control valves.

9 Hours

Content: Fluids, Lines, and Fittings

Student Performance Objectives: Discuss the key issues associated with the installation and specifications of fluid lines and fittings used in a hydraulic environment, including water line specifications for services, and main water distribution. Describe the relationships between fluids, lines, and fittings.

2 Hours

METHODS OF INSTRUCTION:

Lecture, Discussion, Video Presentation, Guest Lecturer, Off-Site Field Trip

OUT OF CLASS ASSIGNMENTS:

Required Outside Hours: 54

Assignment Description: Read appropriate textbook chapters and answer assigned review questions. Study for quizzes and exams.

Required Outside Hours: 54

Assignment Description: Homework: Take-home work problem work sheets with sample problems to be graded and discussed in class.

METHODS OF EVALUATION:

Writing assignments

Percent of total grade: 0.00 %

Course primarily involves skill demonstration or problem solving.

Problem-solving assignments

Percent of total grade: 40.00 %

Percent range of total grade: 40% to 60% Homework Problems, Worksheets

Objective examinations

Percent of total grade: 60.00 %

REPRESENTATIVE TEXTBOOKS:

Required Representative Textbooks

Recommended Representative Textbooks

Rex Miller and Mark R. Miller . Industrial Electricity and Motor Controls, Second Edition, or other appropriate college level text. . McGraw-Hill Publishing,2013.

This text is an industry standard text.

ISBN: 9780071818698

Reading Level of Text, Grade: 11th Verified by: Dana Young

Required Other Texts and Materials

Rex Miller and Mark R. Miller, Audel Pumps and Hydraulics, 6th Edition, Wiley Publishing, ISBN: 0764571168. This text is a standard text in the water industry.

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:

CSU GE:

IGETC:

CSU TRANSFER:

Not Transferable

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: 3
Minimum Hours: 3
Course Control Number: CCC000588790
Sports/Physical Education Course: N
Taxonomy of Program: 095800