Course Outline

COURSE: WTRM 112  DIVISION: 50  ALSO LISTED AS: 

TERM EFFECTIVE: Fall 2018  Inactive Course

SHORT TITLE: APPLIED HYDRAULICS

LONG TITLE: Applied Hydraulics

<table>
<thead>
<tr>
<th>Units</th>
<th>Number of Weeks</th>
<th>Contact Hours/Week</th>
<th>Total Contact Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>18</td>
<td>Lecture: 3</td>
<td>Lecture: 54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lab: 0</td>
<td>Lab: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other: 0</td>
<td>Other: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total: 3</td>
<td>Total: 54</td>
</tr>
</tbody>
</table>

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 is now listed as WTRM 212. ADVISORY: WTRM 101 Introduction to Water/Wastewater Technology; WTRM 102 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

STUDENT LEARNING OUTCOMES:

1. Outline and discuss basic fluid principles.
2. Explain the principles of basic hydraulics.

1/25/2018
Measure of assessment: Homework assignments Quiz
Year assessed, or planned year of assessment: Fall 2017
3. Describe the application and use of centrifugal pumps, rotary pumps, displacement pumps, and special service pumps.
Measure of assessment: Homework assignments Quiz
Year assessed, or planned year of assessment: Fall 2017
4. Explain the applications of hydraulic accumulators.
Measure of assessment: Homework assignments Quiz
Year assessed, or planned year of assessment: Fall 2017
5. Describe the power transmission application of hydraulics.
Measure of assessment: Homework assignments Quiz
Year assessed, or planned year of assessment: Fall 2017
6. List and describe hydraulic power tools used in the water industry.
Measure of assessment: Homework assignments Quiz
Year assessed, or planned year of assessment: Fall 2017
7. Explain the function and use of hydraulic cylinders.
Measure of assessment: Homework assignments Quiz
Year assessed, or planned year of assessment: Fall 2017
8. Explain the function and use of control valves.
Measure of assessment: Homework assignments Quiz
Year assessed, or planned year of assessment: Fall 2017
9. Describe the relationships between fluids, lines, and fittings.
Measure of assessment: Homework assignments Quiz
Year assessed, or planned year of assessment: Fall 2017

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS
Inactive Course: 11/13/2017
6 Hours
Content: Basic fluid principles
Student Performance Objectives (SPO): Explain the foundation of fluid principles which support hydraulic theory.
Out-of-Class Assignments: Read Chapter 1 of Miller Book. Answer assigned review questions.
6 Hours
Content: Principles of basic hydraulics.
Student Performance Objectives (SPO): Describe the practical application of water hydraulic theory in a water utility environment
Out-of-Class Assignments: Read Chapter 2 of Miller Book. Answer assigned review questions.
6 Hours
Content: Centrifugal pumps, Rotary pumps, displacement pumps, and special service pump applications.
Student Performance Objectives (SPO): Explain the construction, and operation of different types of pumps used in the water industry
Out-of-Class Assignments: Read Chapters 3-6 of Miller Book. Answer assigned review questions.
3 Hours
Content: Hydraulic Accumulators
Student Performance Objectives (SPO): Describe the different storage devices that store liquid under pressure and explain how liquid stored under pressure can be used to accomplish work.
Out-of-Class Assignments: Read Chapter 7 of Miller Book. Answer assigned review questions.
3 Hours
Content: Power transmission application of hydraulics
Student Performance Objectives (SPO): Describe fluid drives and liquid drives involving couplings and explain how they work.

Out-of-Class Assignments: Read Chapter 8 of Miller Book. Answer assigned review questions.
6 Hours

Content: Mid-Term Exam - Review
Student Performance Objectives (SPO): Explain the principles and applications of basic hydraulic theory.
Out-of-Class Assignments: Review concepts covered to date.
3 Hours

Content: Hydraulic power tools used in the water industry
Student Performance Objectives (SPO): Identify different hydraulic tools using hydraulics with an emphasis on tools used for pipe and appurtenance repairs.
Out-of-Class Assignments: Read Chapter 9 of Miller Book. Answer assigned review questions.
9 Hours

Content: Control Valves
Student Performance Objectives (SPO): Describe the applications of different types of hydraulic and pneumatic control valves used to control water levels.
Out-of-Class Assignments: Read Chapter 11-12 of Miller Book. Answer assigned review questions.
9 Hours

Content: Fluids, Lines, and fittings
Student Performance Objectives (SPO): 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.
Out-of-Class Assignments: Read Chapter 13-14 of Miller Book. Answer assigned review questions.
2 Hours

Final

METHODS OF INSTRUCTION:
Lecture Presentation and Instruction Video presentations Guest Lecturer Off-site Field Trip 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 Problem
Objective examinations
Percent of total grade: 40.00 %

REPRESENTATIVE TEXTBOOKS:
Recommended Representative Textbooks
This text is an industry standard text.
ISBN: 9780071818698
Reading Level of Text, Grade: 11th Verified by: Dana Young
Required Other Texts and Materials
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: 112
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: CCC000529237
Sports/Physical Education Course: N
Taxonomy of Program: 095800