

## Washtenaw Community College Comprehensive Report

### UAT 158 Pump Installation Service and Maintenance (UA 6017) Effective Term: Fall 2020

#### Course Cover

**Division:** Advanced Technologies and Public Service Careers

**Department:** United Association Department

**Discipline:** United Association Training

**Course Number:** 158

**Org Number:** 28200

**Full Course Title:** Pump Installation Service and Maintenance (UA 6017)

**Transcript Title:** Pump Install Serv & Maint 6017

**Is Consultation with other department(s) required:** No

**Publish in the Following:**

**Reason for Submission:** New Course

**Change Information:**

**Rationale:** New United Association course.

**Proposed Start Semester:** Fall 2020

**Course Description:** In this course, students will recognize and evaluate proper pump selection and installation for various piping systems. Students will focus on pump performance, including pump curves, as well as operating characteristics and installation practices. Proper servicing techniques, repair procedures, and laser alignment methods will be discussed and demonstrated in a hands-on lab using manufacturers' recommendations. Limited to United Association program participants.

#### Course Credit Hours

**Variable hours:** No

**Credits:** 1.5

**The following Lecture Hour fields are not divisible by 15: Student Min ,Instructor Min**

**Lecture Hours: Instructor: 22.5 Student: 22.5**

**The following Lab fields are not divisible by 15: Student Min, Instructor Min**

**Lab: Instructor: 1.5 Student: 1.5**

**Clinical: Instructor: 0 Student: 0**

**Total Contact Hours: Instructor: 24 Student: 24**

**Repeatable for Credit:** NO

**Grading Methods:** Letter Grades

Audit

**Are lectures, labs, or clinicals offered as separate sections?:** NO (same sections)

#### College-Level Reading and Writing

College-level Reading & Writing

#### College-Level Math

#### Requisites

#### General Education

**Degree Attributes**

Below College Level Pre-Reqs

## **Request Course Transfer**

### **Proposed For:**

## **Student Learning Outcomes**

1. Identify and describe the basic operation and function of a pump.

### **Assessment 1**

Assessment Tool: Oral quiz

Assessment Date: Fall 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Rubric

Standard of success to be used for this assessment: 80% of the students will score 80% or higher

Who will score and analyze the data: U.A. Instructors

2. Identify major pump classifications by comparing operational theory with common applications.

### **Assessment 1**

Assessment Tool: Written exam

Assessment Date: Fall 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer Key

Standard of success to be used for this assessment: 80% of the students will score 80% or higher.

Who will score and analyze the data: U.A. Instructors

3. Identify the fundamentals of pump performance and measurement using pump curves.

### **Assessment 1**

Assessment Tool: Worksheet

Assessment Date: Fall 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Rubric

Standard of success to be used for this assessment: 80% of the students will score 80% or higher.

Who will score and analyze the data: U.A. Instructors

4. Identify and apply best practices for pump installation in a piping system.

### **Assessment 1**

Assessment Tool: Worksheet

Assessment Date: Fall 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Rubric

Standard of success to be used for this assessment: 80% of the students will score 80% or higher.

Who will score and analyze the data: U.A. Instructors

5. Demonstrate service and repair methods of pumps and related components using manufacturers' recommendations.

### **Assessment 1**

Assessment Tool: Demonstration

Assessment Date: Fall 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Observational Checklist

Standard of success to be used for this assessment: 80% of the students will score 80% or higher.

Who will score and analyze the data: U.A. Instructors

### **Course Objectives**

1. Explain hydronic theory and terminology in relation to pumps.
2. Describe ways to lift liquids and transfer BTU for heating and cooling.
3. List examples and applications of pumps and their usages.
4. Review electrical, thermal, and hydronic safety and the personal protection equipment (PPE) needed when servicing, replacing and installing pumps.
5. Compare and contrast positive displacement pumps and centrifugal pumps.
6. Describe principles of centrifugal force and how flow is created in pumps.
7. Explain the mechanical function and common types of reciprocating pumps.
8. Define and calculate pump head, system head, gallons per minute (GPM), valve flow coefficient (Cv), water and brake horsepower, etc.
9. Define and calculate pump curve.
10. Demonstrate how to plot pump performance on pump curves of individual piping systems.
11. Identify typical installation requirements associated with manufacturers recommendations.
12. Describe pump grouting and its importance for proper pump operation.
13. Review piping practices to enhance optimal pump performance.
14. Disassemble and assemble centrifugal pumps.
15. Align motor to pump shaft using laser trainer.
16. Perform simulated seals replacement on trainer pumps.

### **New Resources for Course**

#### **Course Textbooks/Resources**

Textbooks

Manuals

Periodicals

Software

#### **Equipment/Facilities**

<b><u>Reviewer</u></b>	<b><u>Action</u></b>	<b><u>Date</u></b>
<b>Faculty Preparer:</b> <i>Tony Esposito</i>	<i>Faculty Preparer</i>	<i>Apr 01, 2020</i>
<b>Department Chair/Area Director:</b> <i>Marilyn Donham</i>	<i>Recommend Approval</i>	<i>Apr 06, 2020</i>
<b>Dean:</b> <i>Jimmie Baber</i>	<i>Recommend Approval</i>	<i>Apr 13, 2020</i>
<b>Curriculum Committee Chair:</b> <i>Lisa Veasey</i>	<i>Recommend Approval</i>	<i>May 07, 2020</i>

**Assessment Committee Chair:**

*Shawn Deron*

*Recommend Approval*

*May 10, 2020*

**Vice President for Instruction:**

*Kimberly Hurns*

*Approve*

*May 12, 2020*