

UAT 158: PUMP INSTALLATION SERVICE AND MAINTENANCE (UA 6017)

History

1. Dec 4, 2025 by Sera Bird (sabird)

Viewing: UAT 158 : Pump Installation Service and Maintenance (UA 6017)

Last approved: 2025-12-04T08:05:07Z

Last edit: 2025-11-26T20:52:46Z

Effective Term

Winter 2026

Rationale and proposal summary

This course is being updated to reflect current trends and technology in the industry.

Course Cover

Full Course Title

Pump Installation Service and Maintenance (UA 6017)

Transcript Title

Pump Install Serv & Maint 6017

Subject Code

UAT - United Association Training

Course Number

158

Department

United Assoc Dept (UAT Only) (UATD)

Banner Division

ATP

Division/College

Adv Tech/Public Serv Careers (AT)

Org Code

28200

Course Description

In this course, students will be introduced to pump service, installation, and maintenance techniques. Upon completion of the class, students will be able to describe what a pump is and its basic function, articulate major pump classifications, as well as compare and contrast operational theory with common applications. They will define best practices for pump installation in a system, and explain the fundamentals of pump performance and measurement. Through hands-on lab work, students will demonstrate familiarity with pump components and methods to service and repair pumps. Limited to United Association program participants.

Has this course been approved for online or online blended?

Yes

Grading method

Standard Letter, Audit

CIP Code

469999 - Construction Trades, Other.

Occupational Indicator

Yes

ACS Code

130

Degree Attributes

BCL - Below College Level Pre-Reqs

Credit hours, contact hours, repeatability

Repeatable for additional credit

No

Course credits

1.5

Lecture contact hours

22.5

Lab contact hours

1.5

Total Contact Hours

24

Expected Total Contact Hours

24

Prerequisites and prerequisite skill levels

College-Level Math

No Level Required

College-Level Reading and Writing

College-level Reading and Writing

Approved Level I Prerequisite:

Academic Reading and Writing Levels of 6

Course Assessment Plan

Learning Outcome

Outcome

Describe the basic operation and function of a pump.

Assessment #1

Assessment Tool

Outcome-related quiz

Anticipated Next Assessment Year

2025

Anticipated Next Assessment Term

Summer

Assessment Cycle

Every Three Years

Anticipated assessment population

All students from all sections

How the assessment will be scored

Answer key

Who does the scoring?

U.A. Instructors

Standard of success

80% of the students will score 80% or higher.

Assessment #2

Learning Outcome**Outcome**

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

Assessment #1**Assessment Tool**

Outcome-related quiz

Anticipated Next Assessment Year

2025

Anticipated Next Assessment Term

Summer

Assessment Cycle

Every Three Years

Anticipated assessment population

All students from all sections

How the assessment will be scored

Answer key

Who does the scoring?

U.A. Instructors

Standard of success

80% of the students will score 80% or higher.

Assessment #2

Learning Outcome**Outcome**

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

Assessment #1**Assessment Tool**

Outcome-related worksheet

Anticipated Next Assessment Year

2025

Anticipated Next Assessment Term

Summer

Assessment Cycle

Every Three Years

Anticipated assessment population

All students from all sections

How the assessment will be scored

Answer key

Who does the scoring?

U.A. Instructors

Standard of success

80% of the students will score 80% or higher.

Assessment #2

Learning Outcome**Outcome**

Identify best practices for pump installation in a piping system.

Assessment #1**Assessment Tool**

Outcome-related quiz

Anticipated Next Assessment Year

2025

Anticipated Next Assessment Term

Summer

Assessment Cycle

Every Three Years

Anticipated assessment population

All students from all sections

How the assessment will be scored

Answer key

Who does the scoring?

U.A. Instructors

Standard of success

80% of the students will score 80% or higher.

Assessment #2

Learning Outcome**Outcome**

Demonstrate methods for servicing and repairing pumps and components through a series of hands-on exercises.

Assessment #1**Assessment Tool**

Outcome-related demonstration

Anticipated Next Assessment Year

2025

Anticipated Next Assessment Term

Summer

Assessment Cycle

Every Three Years

Anticipated assessment population

All students from all sections

How the assessment will be scored

Observational checklist

Who does the scoring?

U.A. Instructors

Standard of success

80% of the students will score 80% or higher.

Assessment #2**Course Objectives**

	Objective(s)
1.	Explain hydronic theory and terminology in relation to pumps.
2.	Describe ways to lift liquids and transfer British thermal unit (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.	Describe pump grouting and its importance for proper pump operation.
6.	Describe two ways in which liquids can be raised.
7.	Describe the difference between positive displacement and centrifugal pumps.
8.	Describe the principles of centrifugal force and how it creates flow in centrifugal pumps.
9.	Explain the mechanical function and common types of reciprocating pumps.
10.	Summarize typical pump manufacturers' installation requirements listed in their manuals.
11.	Discuss best piping practices for optimal pump installation.
12.	Define various pump performance terms such as pump head, system head, valve flow coefficient (Cv), gallons per minutes (GPM), water, and brake horsepower, etc.
13.	Define pump curves and how calculations are used in piping systems.
14.	Demonstrate how to plot pump performance on a pump curve.
15.	Disassemble and reassemble a centrifugal pump.
16.	Align two shafts on the trainer (motor to pump).
17.	Perform a simulated seal replacement on a trainer pump.

General Education Area(s)**Area 1: Writing**

No

Area 2: 2nd Writing or Communication/Speech

No

Area 3: Mathematics

No

Area 4: Natural Science

No

Area 5: Social and Behavioral Science

No

Area 6: Arts and Humanities

No

MTA General Education

No

Review

Is conditional approval requested?

No

Is this course currently conditionally approved, and you are now submitting it for full approval?

No

Key: 8808

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

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