

## Washtenaw Community College Comprehensive Report

### UAT 247 Piping Codes for Industrial Work (UA 8004)

Effective Term: Fall 2020

#### Course Cover

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

**Department:** United Association Department

**Discipline:** United Association Training

**Course Number:** 247

**Org Number:** 28200

**Full Course Title:** Piping Codes for Industrial Work (UA 8004)

**Transcript Title:** Piping Codes Indust Work 8004

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

**Publish in the Following:** College Catalog , Web Page

**Reason for Submission:** Course Change

**Change Information:**

**Consultation with all departments affected by this course is required.**

**Course title**

**Course description**

**Outcomes/Assessment**

**Objectives/Evaluation**

**Rationale:** Updating United Association course

**Proposed Start Semester:** Fall 2020

**Course Description:** In this course, students will identify piping codes and the properties of metals. Topics will include the history of codes, piping metallurgy, material selection, installation, and welding requirements. They will also review procedures for testing, inspection and stamping, in accordance with the American Society for Mechanical Engineers (ASME) B31.1 code. In addition, students will demonstrate the fundamentals and standards for materials, design of expansion loops, cold springing, and quality control through classroom and hands-on applications. The title of this course was previously ASME B31.1 Code. 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 scope of American Society of Mechanical Engineers (ASME) B31.3 Power Piping Code, B31.3 Process Piping Code, and ASME Section IX Welding and Brazing Qualifications.

#### **Assessment 1**

Assessment Tool: Outcome-related written quiz questions

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

2. Demonstrate the proper use of the code for proposed piping installation, material and components to meet code ASME compliance.

#### **Assessment 1**

Assessment Tool: Skills 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: Skills 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

3. Identify and describe the minimum code provisions required for proper piping practice, including fabrication and assembly.

#### **Assessment 1**

Assessment Tool: Outcome-related written quiz questions

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

4. Demonstrate quality control by applying the verification of code compliance for ASME B31.1, B31.3, Section IX Welding and Brazing Qualifications.

#### **Assessment 1**

Assessment Tool: Skills 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: Skills 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. Develop concepts and strategies needed to teach apprentices how to identify the material requirements of ASME B31.1 code for piping installation.
2. Develop concepts and strategies needed to teach apprentices how to recognize imperfections in the welds and base metals during welding or in-service inspections.
3. Navigate a Quality Control Manual for sections regarding requirements of material selection and documentation.
4. Analyze the history and development of the ASME B31 Codes.
5. Describe the relationship between ASME B31 and other ASME Boiler and Pressure Vessel Codes.
6. Compare the scopes of each code regarding piping systems.
7. Discuss the application and engineering design into code selection.
8. Discuss and utilize applicable codes based on piping system parameters when selecting the code of construction.
9. Discuss tensile strength yield point, and translate mechanical properties into code-calculated allowable stress values for piping materials.
10. Identify the material, components, and joint requirements of ASME B31.1 and B31.3 for piping installations.
11. Analyze piping specifications derived from engineering design for more stringent requirements of the applicable code of construction.
12. Review preheat, inter-pass, and post weld heat-treatment requirements.
13. Discuss visual weld inspection before, during, and after welding.
14. Discuss examination methods, required tests, and inspections used for verification of code compliance.
15. Identify types of non-destructive evaluation (NDE) for installations in compliance with ASME B31.1 and B31.3.
16. Identify and discuss the requirements of documentation for owners, foreman, and fabricators.
17. Discuss the requirements of the applicable ASME stamps with code designator.

### **New Resources for Course**

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

##### Textbooks

Robert A. Lee. *IPT's PIPE TRADES HANDBOOK*, first ed. IPT Publishing and Training Ltd., 2006  
 Jefferson/ Woods . *Metals and How to Weld Them*, second ed. James F. Lincoln Arc Welding Foundation, 1962, ISBN: 0-937390-10-0.

##### Manuals

##### Periodicals

##### Software

#### **Equipment/Facilities**

Level I classroom

Data projector/computer

<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>Jun 04, 2020</i>
<b>Department Chair/Area Director:</b> <i>Marilyn Donham</i>	<i>Recommend Approval</i>	<i>Jun 05, 2020</i>
<b>Dean:</b> <i>Jimmie Baber</i>	<i>Recommend Approval</i>	<i>Jun 10, 2020</i>
<b>Curriculum Committee Chair:</b> <i>Lisa Veasey</i>	<i>Recommend Approval</i>	<i>Oct 16, 2020</i>
<b>Assessment Committee Chair:</b> <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Oct 20, 2020</i>
<b>Vice President for Instruction:</b> <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Oct 22, 2020</i>