

## Washtenaw Community College Comprehensive Report

### UAT 350 Semiconductor Orbital Tube Welding (UA 8047)

Effective Term: Fall 2024

#### Course Cover

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

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

**Department:** United Association Department (UAT Only)

**Discipline:** United Association Training

**Course Number:** 350

**Org Number:** 28200

**Full Course Title:** Semiconductor Orbital Tube Welding (UA 8047)

**Transcript Title:** Semiconductor Orb Welding 8047

**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 2024

**Course Description:** In this course, students will identify the theoretical and practical skills needed for semiconductor orbital tube welding. Students will compare and contrast orbital welding done using various power supplies and demonstrate proper weld specifications, equipment setup, and calibration of the prep tubing. Proper purging, welding coupons, and other procedures will also be addressed. Limited to United Association Instructor Training program graduates.

#### 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. Explain the purpose and concept of orbital welding.

#### **Assessment 1**

Assessment Tool: Outcome-related quiz questions

Assessment Date: Fall 2024

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. Create and upload weld programs for required tube sizes and wall thicknesses on the various power supply units.

#### **Assessment 1**

Assessment Tool: Outcome-related demonstration

Assessment Date: Fall 2024

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: 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. Demonstrate proper equipment setup and breakdown of various power supplies and weld heads, including calibrating weld heads to their corresponding power supply.

#### **Assessment 1**

Assessment Tool: Outcome-related demonstration

Assessment Date: Fall 2024

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: 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

4. Demonstrate cutting, facing, and prepping of various-sized tubing for welding.

#### **Assessment 1**

Assessment Tool: Outcome-related demonstration

Assessment Date: Fall 2024

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: 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

5. Demonstrate the purging and setup procedures for making a weld, making bench welds, and adjusting weld profiles to meet specifications.

#### **Assessment 1**

Assessment Tool: Outcome-related demonstration

Assessment Date: Fall 2024

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: 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. Discuss the clean welding process required for pharma, food plants, breweries, etc.
2. Explain the advantages of continuous welds, as well as the speed, heat, and time needed for orbital tube welding.
3. Explain the concept of step welds and stacking dimes one at a time.
4. Discuss the process of writing and uploading weld programs.
5. Utilize the provided UA Orbital Tube Welding Program Worksheets to develop specified programs.
6. Demonstrate the ability to interface with power supplies to input programs.
7. Demonstrate setup and breakdown of the following power supplies: AMI 107, AMI 207, AMI 217, Orbitalum 180 Smartwelder, Swagelok M200.
8. Upload a calibration program to the welding software provided.
9. Adjust the weld head potentiometer to achieve one revolution.
10. Run the auto-calibration for the orbital tube welding equipment.
11. Discuss and demonstrate the proper personal protective equipment (PPE) needed and the safety protocol that must be observed.
12. Squarely cut tubing using various tools and equipment.
13. Discuss and demonstrate the facing of each end square to be welded.
14. Check for burrs, internal scratches, and other irregularities identified in orbital tuber welding.
15. Discuss weld head purge, flow rates, I.D. purge (inside diameter purge), mag settings, and the tacks-hinge method of welding.
16. Perform welds on the designated power supply.
17. Demonstrate a fillet or ring coupon for inspection.
18. Adjust a weld profile to meet specifications for the required size and wall thickness.

### **New Resources for Course**

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

Textbooks

Manuals

Periodicals

Software

#### **Equipment/Facilities**

**Reviewer**

**Action**

**Date**

**Faculty Preparer:**

*Tony Esposito*

*Faculty Preparer*

*Jan 30, 2024*

