Washtenaw Community College Comprehensive Report

UAT 276 Orbital Tube Welding (UA 8007)
Effective Term: Spring/Summer 2023

Course Cover

College: Advanced Technologies and Public Service Careers
Division: Advanced Technologies and Public Service Careers
Department: United Association Department
Discipline: United Association Training
Course Number: 276
Org Number: 28200
Full Course Title: Orbital Tube Welding (UA 8007)
Transcript Title: Orbital Tube Welding (UA 8007)
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Web Page
Reason for Submission: Course Change
Change Information:
Course title
Course description
Outcomes/Assessment
Objectives/Evaluation
Rationale: Technological updates for United Association course
Proposed Start Semester: Fall 2023
Course Description: In this course, students will acquire the skills to teach their membership the purpose, concept, and intricate procedures of orbital welding using various power supplies. Students will explain the purpose and concept, create and input weld programs, set up and calibrate equipment, prepare weld tubing, as well as purge and weld coupons for inspection. This is accomplished in both the classroom and a hands on Orbital weld lab. 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 the history, equipment, concepts, and procedures involved in orbital welding.
   Assessment 1
   Assessment Tool: Outcome-related quiz
   Assessment Date: Spring/Summer 2023
   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 in accordance with tube sizing and tube wall thickness.
   Assessment 1
   Assessment Tool: Outcome-related demonstration
   Assessment Date: Spring/Summer 2023
   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 set-up and tear-down of orbital tube welding equipment including calibration, power supplies, and weld heads.
   Assessment 1
   Assessment Tool: Outcome-related demonstration
   Assessment Date: Spring/Summer 2023
   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 the methods for cutting, facing, and prepping predetermined tube sizes for orbital welding.
   Assessment 1
   Assessment Tool: Outcome-related demonstration
   Assessment Date: Spring/Summer 2023
   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. Develop a lesson plan to teach the successfully demonstrated skill of executing tack and complete welds on predetermined tube sizes and wall thicknesses.

Assessment 1

Assessment Tool: Outcome-related lesson plan
Assessment Date: Spring/Summer 2023
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

Course Objectives

1. Identify and explain different general operations, power supplies, and connection points of orbital tube welding.
2. Describe and demonstrate parameters regarding installation and set up of equipment.
3. Explain the assembling and calibrating processes as well as how to test-run logistics.
4. Discuss the history of orbital tube welding and its uses in industry.
5. Explain the following terms associated with orbital welding: clean welding process, continuous weld, and step welds.
6. Discuss the interface with power supplies and input programs of AMI 107, AMI 207, AMI 217, Orbitalum 180, and Swagelok M200 orbital welding equipment.
7. Discuss and operate auto-calibration used in orbital welding.
8. Identify the equipment and materials needed for safe orbital welding, including safety considerations and personal protective equipment (PPE).
9. Demonstrate facing procedures for squaring each end of tubing for welding as well as identifying defects such as burrs and internal scratches.
10. Review and demonstrate worksheet instructions to develop welding programs as determined by tube size and thickness.
11. Discuss and demonstrate the procedure and sequence for setting up welding equipment.
12. Discuss potential risks and safety hazards when handling and operating welding equipment.
13. Demonstrate positioning a weld head potentiometer for one revolution.
14. Discuss and demonstrate tube cutting of various tube size and wall thicknesses.
15. Discuss head purge and flow rates of argon gas used in orbital welding.
16. Explain settings and purge rates as they apply to tube sizes and thickness.
17. Demonstrate welding tacks using the hinge method.
18. Perform welds on designated power supply.
19. Demonstrate prepping a fillet or ring coupon for inspection.
20. Adjust a weld profile to meet specifications for required tube size and thickness.
21. Create a lesson plan for teaching a welding demonstration.
22. Develop a rubric for evaluating a welding demonstration.

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals

Periodicals
Software

Equipment/Facilities

Reviewer	Action	Date
Faculty Preparer:		
Tony Esposito	*Faculty Preparer*	*Mar 31, 2023*
Department Chair/Area Director:		
Marilyn Donham	*Recommend Approval*	*Apr 03, 2023*
Dean:		
Jimmie Baber	*Recommend Approval*	*Apr 05, 2023*
Curriculum Committee Chair:		
Randy Van Wagnen	*Recommend Approval*	*May 04, 2023*
Assessment Committee Chair:		
Shawn Deron	*Recommend Approval*	*May 11, 2023*
Vice President for Instruction:		
Victor Vega	*Approve*	*May 12, 2023*

Washtenaw Community College Comprehensive Report

UAT 276 Orbital Tube Welding
Effective Term: Spring/Summer 2016

Course Cover

Division: Advanced Technologies and Public Service Careers
Department: United Association Department
Discipline: United Association Training
Course Number: 276
Org Number: 28200
Full Course Title: Orbital Tube Welding
Transcript Title: Orbital Tube Welding
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 description
Credit hours
Total Contact Hours
Outcomes/Assessment
Rationale: Change credit hours, contact hours, assessment date and text.
Proposed Start Semester: Fall 2015
Course Description: In this course, students will learn methods of teaching orbital fusion welding as used in semiconductor, food and beverage, pharmaceutical and biotechnology industries. This course is designed for students with a TIG welding background. Limited enrollment permits extensive hands-on welding time on the equipment. Students selecting this course should come to class in safe working clothes. Limited to United Association program participants.

Course Credit Hours

Variable hours: No
Credits: 1
Lecture Hours: Instructor: 15 **Student:** 15
The following Lab fields are not divisible by 15: Student Min, Instructor Min
Lab: Instructor: 5 **Student:** 5
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 20 **Student:** 20
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. Demonstrate advanced orbital tub welding skills.
   Assessment 1
   Assessment Tool: Skills checklist
   Assessment Date: Fall 2015
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: checklist
   Standard of success to be used for this assessment: 70% of the students will score 70% or higher.
   Who will score and analyze the data: UA Faculty

2. Explain to apprentices and journey-people the central concepts and skills of orbital tube welding.
   Assessment 1
   Assessment Tool: Teaching demonstration
   Assessment Date: Fall 2015
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: 75% of all students
   How the assessment will be scored: Departmentally-developed rubric
   Standard of success to be used for this assessment: 75% will score 11 or higher out of 16.
   Who will score and analyze the data: UAT faculty

3. Demonstrate to apprentices and journey-people the proper maintenance and repair procedures related to teaching orbital tube welding.
   Assessment 1
   Assessment Tool: Teaching demonstration
   Assessment Date: Fall 2015
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: 75% of all students
   How the assessment will be scored: Departmentally-developed rubric
   Standard of success to be used for this assessment: 75% will score 11 or higher out of 16.
   Who will score and analyze the data: UAT faculty

4. Teach orbital tube welding utilizing approved industry and UA course/training materials.
   Assessment 1
   Assessment Tool: Teaching demonstration
   Assessment Date: Fall 2015
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: 75% of all students
   How the assessment will be scored: Departmentally-developed rubric
   Standard of success to be used for this assessment: 75% will score 11 or higher out of 16.
   Who will score and analyze the data: UAT faculty

Course Objectives

1. Demonstrate advanced orbital tub welding skills.
2. Produce a weld test coupon.
3. Identify and explain different general operations, power supplies, and connection points.
4. Describe and demonstrate parameters regarding installation and set-up of equipment.
5. Explain the assembling and calibrating processes as well as how to test-run logistics.
6. Demonstrate appropriate use and knowledge of course materials.

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Reviewer	Action	Date
Faculty Preparer:		
Justin Carter	*Faculty Preparer*	*Jul 22, 2015*
Department Chair/Area Director:		
Scott Klapper	*Recommend Approval*	*Jul 23, 2015*
Dean:		
Brandon Tucker	*Recommend Approval*	*Jul 24, 2015*
Curriculum Committee Chair:		
Kelley Gottschang	*Recommend Approval*	*Oct 06, 2015*
Assessment Committee Chair:		
Michelle Garey	*Recommend Approval*	*Oct 11, 2015*
Vice President for Instruction:		
Michael Nealon	*Approve*	*Oct 23, 2015*