

# WELDING - ASSOCIATE OF APPLIED SCIENCE (AAS)

## Description

The Associate of Applied Science in Welding is a culmination of the career pathway and one-year certificates of completion. Emphasis is on structural welds that include multiple positions and pipe. Students will weld overhead, vertical, and cylindrical pipe. All welding methods are used. Students also use destructive testing methods of welds.

In order to complete the program, students must satisfactorily complete welding, welding laboratory, and general education courses.

Along with welding, the degree allows electives that can be taken in the machine shop. Students can take manual or computer numerical control (CNC) classes in machining

## Program Learning Outcomes

Upon successful completion of the program, students will be able to:

1. Model industry safety standards in a welding/fabrication environment.
2. Summarize test standards and information in order to pass the American Welding Society Expert Welder practical knowledge qualification written test.
3. Perform the specific skills needed to pass American Welding Society Expert Welder performance qualification tests.
4. Apply inspection, testing, and acceptance criteria at the American Welding Society Expert Welder level.
5. Model effective and appropriate communication with welding professionals and clients.

## Entrance Requirements

### Academic Entrance Requirements

Recommended:

- High school diploma or GED
- Completion of MTH 060 Beginning Algebra or minimum placement Math Level 10
- Successful completion of or current enrollment in MFG 100 MFG Orientation
- College-level computer skills

## Additional Program Costs (Beyond Standard Tuition/Fees and Textbooks)

### Material Costs

Required:

- Welding personal protective equipment and tools: approximately \$250

Recommended:

- A desktop or laptop computer capable of running the latest version of Windows and Microsoft Office: approximately \$600

### Enrollment Fees

- Fees on specific MFG courses: approximately \$1,100 total

## Course Requirements

Course	Title	Credits
<b>Core Courses</b>		
MFG 100	MFG Orientation	1
MFG 101	Blueprint Reading	3
MFG 103	Welding Technology I	4
MFG 105	Welding Technology II	4
MFG 107	Welding Technology III	4
MFG 110	Manufacturing Processes I	4
MFG 119	Manufacturing Design and Drafting Techniques	4
or MFG 119M	Mechanical Drawing Techniques	
MFG 264	Automated Cutting	3
MFG 267	Oxygen-Fuel and Plasma Cutting	3
MFG 271	SMAW I	3
MFG 272	GMAW I	3
MFG 273	SMAW II	3
MFG 274	GMAW II	3
MFG 281	GTAW I	3
MFG 282	FCAW I	3
MFG 283	GTAW II	3
MFG 284	FCAW II	3
MFG 288	Industrial Fabrication	3
MFG 289	Material Handling-Fork Lift Safety	1
MFG 280	Co-op Work Experience Manufacturing	1-4
<b>Welding Program Electives</b>		<b>20</b>
MFG 102	Blueprint Reading Sheet Metal	
MFG 112	Manufacturing Processes II	
MFG 114	Manufacturing Processes III	
MFG 133	Quality Assurance	
MFG 201	Bench Work	
MFG 202	Metals Preparation	
MFG 210	Vertical Milling	
MFG 214	Lathe Operator I	
MFG 216	Lathe Operator II	
MFG 250	Additive Manufacturing	
MFG 254	Manufacturing Jigs and Fixtures	
MFG 256	CNC Mill Programming	
MFG 257	CNC Mill Setup & Operation	
MFG 258	Mastercam Mill	
MFG 259	CNC Lathe Programming	
MFG 260	CNC Lathe Setup & Operation	
MFG 261	Mastercam Lathe	
MFG 266	Manufacturing Cost Estimation	
MFG 275	SMAW III	
MFG 276	GMAW III	
MFG 285	GTAW III	
MFG 286	FCAW III	
<b>Other Required Courses</b>		
Choose one from the following:		3-4

BA 178	Customer Service	
BA 285	Business Human Relations	
COMM 115	Introduction to Intercultural Communication	
COMM 218	Interpersonal Communication	
COMM 219	Small Group Communication	
MTH 102	Applied Technical Mathematics (or choose from the foundational requirements math list)	4
WR 121	Academic Composition	4

**Total Credits** **90-94**

## Advising Notes

Nearly all MFG courses are self-directed, outcome-based curricula. This provides students with a greater degree of flexibility than other programs.

Upon starting their program, students review their desired degree outcome with their advisor, and a coursework sequence is identified. This is particularly important if developmental work is needed.

The program is designed for students planning to enter the manufacturing workforce upon graduation. Often only selected credits are considered transferable to public or private baccalaureate institutions. Before starting any manufacturing technology program, students are advised to contact the institution to which they intend to transfer and identify what credits may be transferable.

Most of the skills development courses in this program require two hours a week in the welding lab for each credit. This usually means students will need to schedule 24 hours or more each week in the lab. The welding lab is staffed Monday through Thursday from 9 am to 8 pm (40 hours a week).

## Performance Standards

- Academic Requirements:
  - Students must have a 2.0 cumulative GPA to earn a COCC certificate or degree.
  - All courses in the program must be completed with a grade of C or higher.

## Sample Plan

### First Year

First Term		Credits
MFG 100	MFG Orientation	1
MFG 101	Blueprint Reading	3
MFG 103	Welding Technology I	4
MFG 110	Manufacturing Processes I	4
MFG 119 or MFG 119M	Manufacturing Design and Drafting Techniques or Mechanical Drawing Techniques	4
<b>Credits</b>		<b>16</b>

### Second Term

MFG 105	Welding Technology II	4
MFG 107	Welding Technology III	4
MFG 264	Automated Cutting	3
MFG 267	Oxygen-Fuel and Plasma Cutting	3
<b>Credits</b>		<b>14</b>

### Third Term

MFG 271	SMAW I	3
MFG 272	GMAW I	3
MFG 281	GTAW I	3
MFG 282	FCAW I	3
Welding program elective		4

**Credits** **16**

### Second Year

#### First Term

MFG 273	SMAW II	3
MFG 274	GMAW II	3
MTH 102	Applied Technical Mathematics (or choose from the foundational requirements math list)	4

Welding program elective (recommend MFG 254) 2

Welding program elective 3

**Credits** **15**

#### Second Term

MFG 283	GTAW II	3
MFG 284	FCAW II	3
WR 121	Academic Composition	4
Welding program elective (recommend MFG 275)		3
Welding program elective		2

**Credits** **15**

#### Third Term

Choose one course from the following: 3-4

BA 178 Customer Service

BA 285 Business Human Relations

COMM 115 Introduction to Intercultural Communication

COMM 218 Interpersonal Communication

COMM 219 Small Group Communication

MFG 280 Co-op Work Experience Manufacturing 1-4

MFG 288 Industrial Fabrication 3

MFG 289 Material Handling-Fork Lift Safety 1

Welding program elective (recommend MFG 276) 3

Welding program elective (recommend MFG 285) 3

**Credits** **14-18**

**Total Credits** **90-94**