

# Welding ATA



## GENERAL INFORMATION

The welding program at EvCC is designed to meet the expanding needs of the many occupations that utilize welding. The welding department provides a balanced course of study, including hands-on learning experiences, technical information and general education courses. Emphasis is on welding, torch burning techniques, and fabrication techniques, with opportunities for attaining these skills in a lab setting.

The welding program is competency based and is divided into separate skill blocks. Each skill block is based on a 100-hour period of laboratory time. An average student should be able to complete a skill block within that time. As a student completes a skill block and demonstrates mastery of those skills by passing an exit test for that skill block, he/she can receive credit for it and move to the next level of training. This permits students to move through the program at their own rate. All welding courses are available as either day or evening classes. Specialty courses of study may be arranged through a welding instructor. Welding labs are limited to eighteen (18) participants on average.

## CAREER OPPORTUNITIES

Today, welders use automated as well as manual methods of joining metal parts through a process of heating the metal pieces and then melting and fusing them together to form a permanent bond. Frequently, they plan their work based upon drawings and speculation figures. Knowledge of blueprint reading is important, along with knowledge of the properties of different materials, knowledge of applied techniques and expected results of heating and melding of various types

of metals. These skills and competencies are well addressed by EvCC's welding program.

Most employers will require the ability to lift and carry 50 pounds. Good eyesight, hand-eye coordination, manual dexterity and the ability to concentrate on detail work for long periods and work in awkward positions, at times, are important traits for a person considering this career.

Welders may find employment in places such as: manufacturing and repair shops, shipbuilding yards, the aerospace industry, construction of buildings, bridges and other structures; also joining pipes for pipelines, power plants, refineries and the high-tech sector using CNC controlled equipment. Welders can advance to more skilled jobs with additional training and experience. Opportunities exist to become supervisors, inspectors and instructors.

## PROGRAM OUTCOMES

1. Build practical skills toward industry standards.
2. Build soft skills toward industry standards.
3. Build skills toward state and national welding certifications.
4. Demonstrate safe work habits that reflect concern and care for self, others, and the environment.
5. Work as an effective team member as well as independently.

## OPTIONS

**Technical Certification – Welding** – Designed for those wishing to enter the workforce as quickly as possible with certification in specific skills. Students acquire specific skills through experience and/or classes. Practice sessions are available in 24-hour blocks of time through EvCC's **Welding 225** course for 2 credits. Individuals having the welding skills necessary to weld to the standards required by the Washington Association of Building Officials (WABO) may participate in EvCC's certification testing service. WABO certification is available in the following skills:

- ◆ SMAW Stick electrode – unlimited plate
- ◆ FCAW Flux cored arc welding – unlimited plate
- ◆ FCAW Shop
- ◆ SMAW (Light gauge)
- ◆ FCAW (Light gauge)
- ◆ SMAW (Pipe)

To make an appointment for certification testing, please call 425-388-9096.

### Associate in Technical Arts (ATA) Degree in Welding

The ATA is a technical degree that includes emphasis in developing professional welding and fabrication skills as well as providing a grounding in general studies. This program is approximately two years in length for full-time involvement. It is a total of 90 credits. Upon completion of this ATA students will qualify and may apply for their High School Diploma from EvCC.

### Program Certificate

Certificates includes many of the same Welding and Fabrication classes as the ATA Degree. Completion of the Certificate in Welding totals 43 credits of Welding classes. Completion time is approximately 4 quarters with a full-time course load. In addition to the Certification in Welding there are several other minor certifications that, on average, require 1 quarter of full-time enrollment to achieve. These minor certifications stack-up to become part of the Certification in Welding.

### Job Improvement or Personal Interest Courses in Welding

Special welding courses for those people with a personal interest in welding or who are already involved in

welding and need specific skill upgrading for job improvement.

### Advanced Manufacturing Technology (AMT)

The AMT degree includes classes that focus on specific engineering technology skills used in the manufacturing sector. See the separate curriculum guide for *AMT: Welding and Fabrication*.

## COSTS

Besides tuition, there are some additional costs:

- **Book/lab fees**

Cost is dependent on the courses taken. Textbooks are usually under \$185 for the entire program. Lab fees are approximately \$800 for the complete program. For courses taken outside of the formal program, costs may differ.

- **Safety Equipment/Tools**

A welding student should expect to spend approximately \$500 during the course of the program on the required tools and safety equipment. A student in the Fabrication curriculum may have a larger requirement.

## GETTING STARTED AT EVCC

Enrollment Services provides information about application, orientation and registration for new and continuing students.

- Enrollment Services, Parks 2<sup>nd</sup> Floor, 425-388-9219
- Advising Center, Rainier Hall Room 108, 425-388-9339

For more information about our graduation rates, the median debt of students who completed the program, and other important information, please visit our website at, [www.everettcc.edu/gainfulemployment](http://www.everettcc.edu/gainfulemployment)

## ADVISORS

You may contact any of the advisors listed below:

- ◆ Robert White, AMT 106, 425-388-9457  
[rowhite@everettcc.edu](mailto:rowhite@everettcc.edu)
- ◆ Karl Fulton, AMT 107, 425-388-9447  
[kfulton@everettcc.edu](mailto:kfulton@everettcc.edu)
- ◆ Jason Speicher, AMT 109, 425-388-9964  
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# ASSOCIATE IN TECHNICAL ARTS IN WELDING

This checklist is targeted at students with an interest in Welding. It should be maintained by the student while at Everett Community College. The quarter before expected completion, this checklist should be submitted by the student, with a diploma application, to the Enrollment Services Office. Note that to earn this degree, a cumulative GPA of 2.0 or higher must be maintained. For the ATA in welding, required courses include 13 credits in General Education, including 5 credits of Diversity, and the 26 credits of Technical Core Requirements. The remaining 51 credits may come from any combination of Welding/Fabrication classes or any pre-approved Discipline, with Instructor/Advisor approval. Superscript denotes stackable certificates and repeatability.

Student Name: \_\_\_\_\_ Advisor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

☐ **COMPLETION** of 5 credit Diversity Course

Course Number	Course Title	Credits	Quarter Completed	Grade
MATH 086	Introduction to Algebra	5	_____	_____
ENGL 98/098D	Intro to College Writing	5	_____	_____
H DEV 155	Human Relations in the Workplace	3	_____	_____

See below for acceptable equivalents

## TECHNICAL CORE CLASSES (77 credits Total)

### WELD THEORY (26 Credits Required)

WELD 101	Introduction to Welding	5	_____	_____
WELD 111 <sup>A, B, C</sup>	Basic Layout <sup>R</sup>	2	_____	_____
MFG T 100 <sup>A, B, C</sup>	Preparation for Success and Safety in Industry	5	_____	_____
WELD 150 <sup>B, C</sup>	Blueprint Reading for Industry <sup>R</sup>	5	_____	_____
WELD 151	Carbon Steel Metallurgy for the Trades <sup>R</sup>	3	_____	_____
WELD 152	Welding Base Materials: Processes and Procedures <sup>R</sup>	3	_____	_____
WELD 153	Non-Ferrous Metallurgy for the Trades <sup>R</sup>	3	_____	_____

### WELD PRACTICAL (51 Credits required from any combination of the classes or repeated classes below)

#### **SKILLS (35 Cr recommended)**

WELD 190 <sup>C</sup>	Oxyacetylene	5	_____	_____
WELD 191 and 291 <sup>C</sup>	Basic Arc <sup>R</sup>	5	_____	_____
WELD 192 and 292 <sup>A, C</sup>	Advanced Arc <sup>R</sup>	5	_____	_____
WELD 193 <sup>C</sup>	Basic Pipe <sup>R</sup>	5	_____	_____
WELD 194 and 294 <sup>B, C</sup>	Gas Tungsten Arc Welding <sup>R</sup>	5	_____	_____
WELD 195 <sup>A, C</sup>	Gas Metal Arc/Flux Cored Arc Welding <sup>R</sup>	5	_____	_____
WELD 196 and 296 <sup>C</sup>	Flux Core Arc Welding <sup>R</sup>	5	_____	_____

#### **FABRICATION (10 Cr recommended)**

WELD 210 <sup>C</sup>	Heavy Plat Fabrication <sup>R</sup>	5	_____	_____
WELD 211 <sup>C</sup>	Sheet Metal Fabrication <sup>R</sup>	5	_____	_____
WELD 212 <sup>C</sup>	Pipefitting and Pipe Systems Fabrication <sup>R</sup>	5	_____	_____
WELD 213 <sup>C</sup>	Practical Fabrication and Advanced Welding Techniques <sup>R</sup>	5	_____	_____
WELD 285 <sup>C</sup>	Computer Numeric Controlled (CNC) Plasma Cutting <sup>R</sup>	5	_____	_____
WELD 216 <sup>B, C</sup>	Advanced TIG Welding <sup>R</sup>	2	_____	_____

#### **ELECTIVES**

WELD 154 <sup>C</sup>	Industrial Safety for the Metal Trades	2	_____	_____
WELD 225 and 226 <sup>C</sup>	Welding Skills Building <sup>R</sup>	2	_____	_____
WELD 295 and 297 <sup>C</sup>	Work Experience Internship I and II <sup>R</sup>	2-5	_____	_____
MFG T 119 <sup>C</sup>	Introduction to Robotics	5	_____	_____
WELD 205	Introduction to Fabrication Workshop Improvement	5	_____	_____

#### **Stackable Certificates Superscript:**

**A** = Entry Level Welding Certification -19 Credits

**B** = Advanced TIG Welding – 21 Credits

**C** = Certification in Welding 43 Credits

**R** = Welding classes are practical skills related and there for **Repeatable** for credit per CIF

**TOTAL** \_\_\_\_\_  
**90 Credits required**  
**Minimum 2.0 GPA required**

#### **Acceptable equivalents for GENERAL EDUCATION COURSES**

MATH 086	WELD 105 Introduction to Fabrication Planning / ENG T 101 Intro to Graphics/Measurement / TS 086 Introduction to Algebra
ENGL 098/098D	CMST& 210 Interpersonal Communication
H DEV 155	BUS 110D Business Communications

# EvCC Welding Courses

## **WELD 101 – Introduction to Welding**

Introduction to welding, including safety, set-up, and operation of tools and equipment common to fabrication shop, common metallurgical terms, alloying elements used in the production of carbon steels and their effects. Perform various heat treatments on stainless steels and aluminum alloys, including the use of cryogenics. **Prerequisites: MFG T 100 or concurrent enrollment in MFG T 100, or instructor permission.**

## **WELD 111 – Basic Layout**

Baseline radial cylindrical and triangulation layout techniques used to develop flat pattern, pipe intersections, and conical shapes. Flat pattern layout and basic lofting techniques covering use of base line, radial, cylindrical, and triangulation layout development for small units. May be repeated one time for credit.

## **WELD 150 – Blueprint Reading for Industry**

Overview of engineering drawing symbols used on blueprints and techniques used in their interpretation. Course is heavily inclined toward machine and fabrication trades rather than construction. May be repeated one time for credit.

## **WELD 151 – Carbon Steel Metallurgy for the Trades**

Metallurgical terms as applied to carbon steels, properties of metals, melting and solidification of metals including phase changes, weld bead metallurgy and heat-affected zones. Alloying elements and their effects on weld material. Distortion of materials and its control. May be repeated two times for credit.

## **WELD 152 – Welding Base Materials: Processes and Procedures**

Base material classification systems, welding processes and procedures. May be repeated one time for credit.

## **WELD 153 – Non-Ferrous Metallurgy for the Trades**

Basic metallurgy of stainless steel, cast iron, and aluminum. Heat treatment of non-ferrous materials, non-ferrous material designation systems, filler material designation systems, and welding procedures for aluminum and stainless steel. May be repeated one time for credit.

## **WELD 190 – Oxyacetylene**

Principles and techniques of oxyacetylene welding, brazing, and flame cutting to develop entry-level skills required by industry. May be repeated one time for credit.

## **WELD 191 – Basic Arc**

Principles and techniques of basic manual shielded metal arc welding as required to demonstrate skills necessary to make fillet welds acceptable to industry standards in all positions. May be repeated two times for credit.

## **WELD 192 – Advanced Arc**

Continuation of WELD 191. Development of welding skills to level required for code standards and certification. May be repeated two times for credit.

## **WELD 193 – Basic Pipe**

Principles and techniques of pipe welding using manual and semi-automatic arc processes, materials, joint preparation, filler metal selection, and acceptable shop practices. May be repeated two times for credit.

## **WELD 194 – Gas Tungsten Arc Welding**

Fundamentals and techniques used in gas tungsten arc welding process needed to weld steel, stainless steel, and aluminum materials in all positions. May be repeated two times for credit.

## **WELD 195 – Gas Metal Arc/Flux Core Arc Welding**

Principles and techniques of gas metal arc and flux core arc welding processes on mild steel, stainless steel and aluminum. May be repeated two times for credit.

## **WELD 196 – Flux Core Arc Welding**

Principles and techniques of Flux-cored Arc Welding (FCAW). Development of the skills required for American Welding Society (AWS) D1.1 and/or Washington Association of Building Officials (WAB) 27-13 S standard qualification tests. May be repeated two times for credit.

## **WELD 210 – Heavy Plate Fabrication**

Introduces the development of complex structures, fitting processes and procedures of heavy plate fabrication. Uses standard layout techniques and set-up and operation of press brake. May be repeated one time for credit.

## **WELD 211 – Sheet Metal Fabrication**

Sequences and methods of light gauge metal fabrication. Students plan and produce parts using forming machinery, joining and forming processes. May be repeated one time for credit.

## **WELD 212 – Pipefitting and Pipe Systems Fabrication**

Presents basic pipefitting. Students will fabricate various pipe systems and manifolds working from blueprints. May be repeated one time for credit.

## **WELD 213 – Practical Fabrication and Advanced Welding**

**Techniques** - Sequences and methods of structural steel fabrication and assembly. Students fabricate and join various structural shapes and formed parts into a completed project. May be repeated one time for credit.

## **WELD 214 – Sub-Arc Welding/Press Brake Operation**

This course covers the basic safety, set up and operation of our 120 ton hydraulic press brake including bending sequences, bump rolling of pipe sections and basic maintenance of the equipment. . **Prerequisite: WELD 195/196, WELD 210, or instructor permission.** May be repeated two times for credit.

## **WELD 216 – Advanced TIG Welding**

Advanced TIG welding techniques used in specialized manufacturing such as Aero Space and the Nuclear Industry. Course will include use of water cooled torches, purge systems and gas lenses. The focus will be stainless steel plate and pipe and Certification through the Washington Association of Building Officials (W.A.B.O.) May be repeated two times for credit.

## **WELD 225 – Welding Skills Building**

Designed for the student who is seeking practice time prior to taking a state welding certification test or for the student seeking to improve current welding skills through additional lab time. May be repeated two times for credit.

## **WELD 285 – Computerized Torch Cutting**

Programming and use of computerized cutting system using AutoCAD. May be repeated one time for credit.

## **WELD 287 – CNC Waterjet Cutting**

This course serves as an introduction to the waterjet cutting process. Students will program the machine based on CAD drawings and learn the setup, adjustments and operation of the CNC waterjet table on a variety of metals including ferrous and non-ferrous metals and carbon fiber composites. **Prerequisite: Instructor's permission.** May be repeated two times for credit.

## **WELD 295 – Work Experience Internship**

Provides students with a safe, supervised work environment to apply their welding and fabrication skills, fostering professional growth and self-confidence in the welding industry. May be repeated one time for credit. **Prerequisites: Instructor's permission.**

## Welding Certificate Suggested Course Sequence

First Quarter		Second Quarter		Third Quarter	
COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS
MFG T 100	5	WELD ELECTIVE	5	WELD ELECTIVE	5
WELD 101	5	FABRICATION ELECTIVE	5	WELD ELECTIVE	5
WELD 111	2	WELD 150	5	FABRICATION ELECTIVE	5
<b>Total Credits</b>	12		15		15

## Welding ATA Suggested Course Sequence Fall Start

First Quarter		Second Quarter		Third Quarter	
COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS
WELD ELECTIVE	5	FABRICATION ELECTIVE	5	WELD ELECTIVE	5
WELD 111	2	MFG T 100	5	FABRICATION ELECTIVE	5
ENGL 098	5	MATH 086	5	BUS 110D	5
<b>Total Credits</b>	12		15		15

  

Fourth Quarter		Fifth Quarter		Sixth Quarter	
COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS
WELD 151	3	WELD 152	3	WELD 153	3
WELD ELECTIVE	5	FABRICATION ELECTIVE	5	WELD ELECTIVE	5
WELD 150	5	WELD ELECTIVE	5	FABRICATION ELECTIVE	5
WELD 225	2	WELD 216	2	WELD 225	2
<b>Total Credits</b>	15		15		15

## Welding ATA Suggested Course Sequence Winter Start

First Quarter		Second Quarter		Third Quarter	
COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS
WELD ELECTIVE	5	FABRICATION ELECTIVE	5	WELD ELECTIVE	5
WELD 111	2	MFG T 100	5	FABRICATION ELECTIVE	5
ENGL 98	5	MATH 86	5	BUS 110D	5
<b>Total Credits</b>	12		15		15

  

Fourth Quarter		Fifth Quarter		Sixth Quarter	
COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS
WELD 152	3	WELD 153	3	WELD 151	3
WELD ELECTIVE	5	FABRICATION ELECTIVE	5	WELD ELECTIVE	5
WELD 150	5	WELD ELECTIVE	5	FABRICATION ELECTIVE	5
WELD 225	2	WELD 216	2	WELD 225	2
<b>Total Credits</b>	15		15		15

## Welding ATA Suggested Course Sequence Spring Start

First Quarter		Second Quarter		Third Quarter	
COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS
WELD ELECTIVE	5	FABRICATION ELECTIVE	5	WELD ELECTIVE	5
WELD 111	2	MFG T 100	5	FABRICATION ELECTIVE	5
ENGL 98	5	MATH 86	5	BUS 110D	5
<b>Total Credits</b>	12		15		15

  

Fourth Quarter		Fifth Quarter		Sixth Quarter	
COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS	COURSE / YEAR	CREDITS
WELD 153	3	WELD 151	3	WELD 152	3
WELD ELECTIVE	5	FABRICATION ELECTIVE	5	WELD ELECTIVE	5
WELD 150	5	WELD ELECTIVE	5	FABRICATION ELECTIVE	5
WELD 225	2	WELD 216	2	WELD 225	2
<b>Total Credits</b>	15		15		15