

EVERETT COMMUNITY COLLEGE **Advanced Manufacturing Technology**
Welding & Fabrication

GENERAL INFORMATION

Everett Community College offers a number of pathways toward technical careers, using stackable certificates and degrees. The first level, for students seeking entry into the technical world would be the **Manufacturing Pre-Employment Certificate**, a credential that would allow one to work in entry-level manufacturing. The next level up would be to take classes leading to a **Skills-Oriented Certificate**. And for those seeking a higher level of education, and the job skills and responsibilities that go with it, EvCC offers skills oriented **ATA Degrees**. This Advanced Manufacturing Technology curriculum guide describes all three levels in the Welding and Fabrication discipline. This program also provides a flexible framework for the incorporation of credit from prior learning in industry or government. An early conference with one of the designated advisors is strongly suggested for success.

THE PROGRAM

The Advanced Manufacturing Technology – Welding and Fabrication Program is part of a cluster of programs. Four **Associate in Technical Arts degrees** and nine **certificates in Advanced Manufacturing Technology** are offered, and may be pursued on a full-time or part-time basis at Everett Community College (EvCC).

ATA degree Programs :

- **Advanced Manufacturing Tech – Composites***
- **Advanced Manufacturing Tech – Mechatronics***
- **Advanced Manufacturing Tech – Precision Machining***
- **Advanced Manufacturing Tech – Technical Design (CAD)***
- **Advanced Manufacturing Tech - Welding and Fabrication**

Certificate Programs :

- **Manufacturing Pre-Employment**
- **Composites ***
- **Precision Machining ***
- **Engineering Technology (CAD) ***
- **CATIA 3D Experience ***
- **Welding and Fabrication**
- **Mechatronics ***
- **Introduction to Composites ***
- **Introduction to Robotics ***
- * **Described in a separate guide.**

The overall program is designed for maximum flexibility, in that one may choose to take one or two courses to enhance their current skills, or pursue a certificate or degree, depending on their goals. The program outcomes for students pursuing the degree will prepare them to perform the following tasks:

- ◆ Solve Technical Mathematical Problems
- ◆ Demonstrate technical welding skills to prepare for industry certification or to be technically competent in a particular welding job or field.
- ◆ Document technical activities in written and verbal reports
- ◆ Work as an effective and dependable team member as well as independently.
- ◆ Demonstrate safe work habits that reflect concern and care for self, others and the environment.
- ◆ Develop the skills necessary to secure employment

Approved by Instructional Council March 2020

CREDIT FOR PRIOR LEARNING

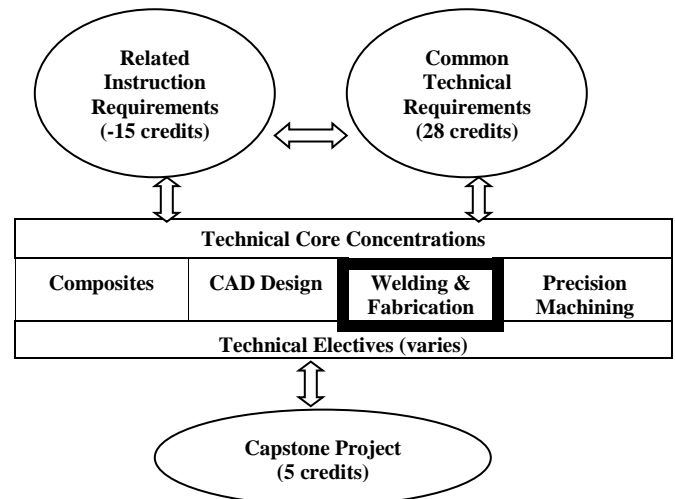
Adults with work experience or completion of industry training programs may be eligible for college credit by following “External Credit” evaluation procedures. Students currently in high school may take selected technical courses while in high school and apply at that time for college credit.

External Credit: Contact Enrollment Services
 Call: 425-388-9219

Tech Prep: www.everettcc.edu/techprep
 Or contact your high school counselor

THE COURSES

The courses for this program may be divided into four categories: Related Instruction requirements (15 credits), common technical requirements (31credits), technical core concentration classes (28 to 40 credits), technical electives (credit varies) and the final capstone class (5 credits). Students seeking an ATA degree will take the number of credits shown in each area plus a number of technical elective classes until the total credit accumulations meets or exceeds the degree requirement. Note that a minimum of 28-40 credits need to come from any one technical concentration to qualify for that particular degree. The actual courses are listed further on in this curriculum guide. See the diagram below for an understanding of how the courses interrelate.



GETTING STARTED AT EVCC

Our Enrollment Services Office provides information about application, advising, orientation and registration for new and continuing students. Students interested in the program should talk to an advisor prior to selecting classes for the first quarter:

Advising Center	425-388-9339
Enrollment Services	425-388-9219
AMTEC Reception	425-388-9570
CAD (David Primacio)	425-267-0160
CAD (Sean Auger)	425-388-9534
Welding (Robert White)	425-388-9457
Welding (Karl Fulton)	425-388-9447
Composites (Michael Patching)	425-388-9092
Precision Machining (Darin Chase)	425-388-9390
Mechatronics (Kenneth Ackerman)	425-388-9290

ATA Degree: Advanced Manufacturing Tech – Welding and Fabrication 90 credits

The courses required for an **Associate in Technical Arts Degree in Advanced Manufacturing Tech – Welding and Fabrication** are listed below. Students should meet with an advisor and maintain this checklist while at Everett Community College. The quarter before expected completion, this checklist should be submitted with a diploma application to the Enrollment Services Office. EvCC does not offer every course each quarter, so please consult a class schedule and an advisor to plan course selections. Note that to earn this degree, a cumulative GPA of 2.0 or higher must be maintained.

Student Name: _____ **Advisor Signature:** _____ **Date:** _____

COMPLETION of Diversity Course (recommend BUS 110D or ENGL 098D or &101D): _____

<u>Course Number</u>	<u>Course Title</u>	<u>Credits</u>	<u>(Year Completed)</u>	
			<u>Quarter Planned</u>	<u>Quarter completed</u>
RELATED INSTRUCTION (15 credits)				
ENG T 101 (or MATH 086 or higher)	Introduction to Graphics and Measurements	5	_____	_____
ENGL 098/098D or ENGL& 101/101D	Intro to College Writing or English Composition I	5	_____	_____
BUS 110D, BUS 165, CMST& 210, CMST 230, H DEV 155	Human Relations (R) course from this group; Business 110D Recommended	3-5	_____	_____
COMMON TECHNICAL REQUIREMENTS (31 credits)				
MFG T 100*	Preparation for Success and Safety in Industry	5	_____	_____
CT 101 or Higher	Introduction to Composites	5	_____	_____
MFG T 117 or WELD 150	Blueprint Reading and Schematics	3-5	_____	_____
ENG T 108 or higher	Engineering Graphics: 3D CAD	4	_____	_____
MFG T 101 or higher	Introduction to Machining	5	_____	_____
WELD 101*	Introduction to Welding	5	_____	_____
WELD 111	Basic Layout	2	_____	_____
WELDING AND FABRICATION TECHNICAL CORE REQUIREMENTS (28 credits)				
Required:				
WELD 152	Welding Base Materials, Processes and Procedures	5	_____	_____
WELD 191	Basic Arc	5	_____	_____
WELD 193	Basic Pipe	5	_____	_____
WELD 195	Gas Metal Arc/Flux Core Arc Welding	5	_____	_____
WELD 194	Gas Tungsten Arc Welding	5	_____	_____
Optional:				
WELD 151	Carbon Steel Metallurgy	3	_____	_____
WELD 153	Non-ferrous Metallurgy for the Trades	5	_____	_____
WELD 192	Advanced Arc	5	_____	_____
WELD 210	Heavy Plate Fabrication	5	_____	_____
WELD 211 or WELD 217	_____	5	_____	_____
WELD 212	Pipefitting & Pipe Systems Fabrication	5	_____	_____
WELD 213	Practical Fabrication & Adv. Welding Techniques	5	_____	_____
WELD 214	Sub-Arc Welding /Press Brake Operation	5	_____	_____
WELD 225	Welding Skills Building	5	_____	_____
WELD 285 or WELD 286	_____	5	_____	_____
WELD 295	Work Experience Internship	2 - 5	_____	_____
TECHNICAL ELECTIVES – select from the list above or see the last page for suggestions. (11-15 credits)				
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
CAPSTONE PROJECT REQUIREMENTS (5 credits – select one class from the list below. Generally follows all other classes.)				
MFG T 229 or MFG T 230	Manufacturing Team Project	5	_____	_____

MINIMUM REQUIRED CREDITS 90 Min 2.0 cumulative GPA each class

* If you already have the certificate, this class was embedded in the certificate and you don't need to take it.

Interested in transferring to a university? Students completing this ATA degree can transfer directly to the Information Technology and Administrative Management (ITAM) program at Central Washinton University or to the Manufacturing Operations program at Clover Park Technical College to pursue a Bachelor of Applied Science(BAS) degree. Go to www.cwu.edu/it-management/bas-overview or www.cptc.edu/programs/basmo for more information.

Certificate: Advanced Manufacturing Tech – Welding and Fabrication 40 credits

The courses required for a **Certificate in Advanced Manufacturing Tech – Welding and Fabrication** are listed below and represent a subset of the classes required for an Associate degree. Students should meet with an advisor and maintain this checklist while at Everett Community College. The quarter before expected completion, this checklist should be submitted with a diploma application to the Enrollment Services Office. EvCC does not offer every course each quarter, so please consult a class schedule and an advisor to plan course selections. Note that to earn this certificate, each course must be completed with a grade of 2.0 or higher.

Student Name: _____ **Advisor Signature:** _____ **Date:** _____

Select a minimum of 40 credits from the following:

<u>Course Number</u>	<u>Course Title</u>	<u>Credits</u>	<u>Quarter Planned</u>	<u>Quarter completed</u>	<u>Grade</u>
Required:					
WELD 152 or WELD 101	_____	5	_____	_____	_____
WELD 191	Basic Arc	5	_____	_____	_____
WELD 193	Basic Pipe	5	_____	_____	_____
WELD 194	Gas Tungsten Arc Welding	5	_____	_____	_____
WELD 195	Gas Metal Arc/Flux Core Arc Welding	5	_____	_____	_____
WELD 150 or ENG T 100	Blueprint Reading or Engineering Graphics	5	_____	_____	_____
MFG T 100	Safety for Manufacturing	4	_____	_____	_____
Select Additional Classes:					
WELD 111	Basic Layout	2	_____	_____	_____
WELD 151	Carbon Steel Metallurgy for the Trades	3	_____	_____	_____
WELD 153	Non-ferrous Metallurgy for the Trades	5	_____	_____	_____
WELD 192	Advanced Arc	5	_____	_____	_____
WELD 210	Heavy Plate Fabrication	5	_____	_____	_____
WELD 211 or WELD 217	Sheet Metal Fabrication	5	_____	_____	_____
WELD 212	Pipefitting & Pipe Systems Fabrication	5	_____	_____	_____
WELD 213	Practical Fabrication & Adv. Welding Techniques	5	_____	_____	_____
WELD 214	Sub-Arc Welding /Press Brake Operation	5	_____	_____	_____
MINIMUM REQUIRED CREDITS		40			

Welding and Fabrication Certificate Suggested Course Sequence

First Quarter		Second Quarter		Third Quarter	
COURSE	CREDITS	COURSE	CREDITS	COURSE	CREDITS
MFG T 100	5	WELD 101	5	WELD 150	5
WELD 191	5	WELD 194	5	WELD 195	5
ELECTIVE	5	WELD 193	5	ELECTIVE	5
Total Credits	15		15		15

Welding and Fabrication ATA Suggested Course Sequence

First Quarter		Second Quarter		Third Quarter	
COURSE	CREDITS	COURSE	CREDITS	COURSE	CREDITS
MFG T 100	5	WELD 101	5	ENGL 098D	5
WELD 191	5	WELD 194	5	WELD 195	5
WELD 287	5	WELD 193	5	ELECTIVE	5
Total Credits	15		15		15
Fourth Quarter		Fifth Quarter		Sixth Quarter	
COURSE	CREDITS	COURSE	CREDITS	COURSE	CREDITS
WELD 152	5	ELECTIVE	5	MFG T 101	5
BUS 110D	5	ENG T 101	5	MFG T 229	5
ENG T 108	4	CT 101	5	ELECTIVE	5
ELECTIVE	5				
Total Credits	19		15		15

GENERAL INFORMATION

The Manufacturing Pre-Employment certificate is a one-quarter program designed to prepare students to work at the entry level in a manufacturing facility and the aerospace industry.

This course serves as an introduction to manufacturing. The knowledge and skills acquired in this course are required for entry level positions in diverse workplace scenarios with special emphasis on aerospace. Content includes a survey of mechanical concepts, precision measurement, blueprint reading, quality assurance, workforce skills/communication, ergonomics, lean manufacturing, and sustainable business practices.

This certificate may be considered a stand-alone credential for people seeking to enter the manufacturing field, or as part of a stackable set of certificates and degrees in the EvCC Advanced Manufacturing Program.

GETTING STARTED AT EVCC

Our Enrollment Services Office provides information about application, advising, orientation and registration for new and continuing students. If students have questions about applying or getting started they may contact Enrollment Services. Contact:

- ◆ Enrollment Services, Parks Student Union, 425-388-9219
admissions@everettcc.edu
- ◆ Advising Center, Rainier Hall 108, 425-388-9339

PROGRAM CERTIFICATE OUTCOMES

- Understand and solve basic technical mathematical problems
- Communicate orally and in writing about technical activities
- Be prepared for successful employment
- Understand and work with entry level technical and mechanical systems
- Perform work using basic computer skills
- Meet industry requirements for safety and first aid

PROGRAM ADVISOR

For specific guidance about this certificate, contact the Advanced Manufacturing Training & Education Center at 425-388-9570.

Certificate: Manufacturing Pre-Employment 12 Credits

This checklist is targeted at students with an interest in an entry level manufacturing systems and/or the aerospace industry. Upon enrollment, this checklist should be submitted with a diploma application to the Enrollment Services Office.

Student: _____ Advisor Signature: _____ Date: _____

Course Number	Course Title	Credits	Quarter Planned	Quarter Done	Grade
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REQUIRED COURSES

MFG T 102	Manufacturing Employment Readiness	12			
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TOTAL: 12 credits Minimum 2.0 GPA

This certificate satisfies the requirements for MFG T 100 and Technical Electives of the Advanced Manufacturing ATA Degree.

Everett Community College does not discriminate based on, but not limited to, race, color, national origin, citizenship, ethnicity, language, culture, age, sex, gender identity or expression, sexual orientation, pregnancy or parental status, marital status, actual or perceived disability, use of service animal, economic status, military or veteran status, spirituality or religion, or genetic information in its programs, activities, or employment. The Title IX Coordinator has been designated to handle inquiries regarding nondiscrimination policies and can be reached at 2000 Tower Street, Everett, WA 98201, TitleIXCoordinator@everettcc.edu, or 425-388-9271. This publication is effective **SEPTEMBER 2020**. The College reserves the right to change courses, programs, degrees and requirements. It is the student's responsibility to be aware of correct information by routinely checking with Enrollment Services and/or the advisors listed in this publication. Requirements applicable to all certificates and degrees are published in the College Catalog. Nothing contained herein shall be construed to create any offer to contract or any contractual rights. For more information, call 425-388-9219, Everett Community College, 2000 Tower Street, Everett, WA 98201, www.everettcc.edu

DEGREE ELECTIVES

You must complete at least 11 elective credits to satisfy the ATA degree requirements in this program. These should be technical in nature, but need not be if your selection enhances your ultimate employability. Any college level English course, for example, would enhance your communication skills and be considered acceptable. Please browse through the college catalog and examine the wide variety of courses offered at EvCC. The following list is presented for your convenience and represents some of the more commonly selected elective courses.

MANUFACTURING TECHNOLOGY

MFG T 104	Machine Operator I
MFG T 105	Machine Operator II
MFG T 202	LEAN Operations Management

COMPOSITE TECHNOLOGY

CT 161	Materials and Processes
CT 202	Composites
CT 120	Composite Fabrication
CT 125	Composite Assembly
CT 130	Composite Repair
CT 145	Composite Special Projects

WELDING/FABRICATION TECHNOLOGY

WELD 111	Basic Layout
WELD 150	Blueprint Reading for Industry
WELD 151	Carbon Steel Metallurgy for the Trades
WELD 152	Welding Base Materials: Processes & Procedures
WELD 153	Non-Ferrous Metallurgy for the Trades
WELD 190	Oxyacetylene
WELD 191	Basic Arc
WELD 192	Advanced Arc
WELD 193	Basic Pipe
WELD 194	Gas Tungsten Arc Welding (TIG)
WELD 195	Gas Metal Arc/Flux Core Arc Welding
WELD 196	Flux Core Arc Welding
WELD 210	Heavy Plate Fabrication
WELD 211 or 217	Sheet Metal Fabrication or Aerospace Sheet Metal Fabrication
WELD 212	Pipefitting & Pipe Systems Fabrication
WELD 213	Practical Fabrication & Adv. Welding Techniques
WELD 214	Sub-Arc Welding/Press Brake Operation
WELD 216	Advanced Tig Welding
WELD 225	Welding Skills Building
WELD 285 or 286	CNC Plasma Cutting or Aerospace CNC Plasma Cutting
WELD 295	Work Experience Internship

ENGLISH COURSES

You may select any English course, ENGL& 101 or higher, or any Communications course (CMST).

HUMAN RELATIONS (R)

You may take any human relations course listed on Page 2

INTERNSHIP

MFG T 171
MFG T 172

TECHNICAL DESIGN (CAD)

ENG T 100	Introduction to Engineering Graphics and 2D AutoCAD
ENG T 103	Introduction to Revit
ENG T 196	Advanced Workbenches with CATIA v5
ENG T 203	Intermediate AutoCAD
ENGR& 114	Engineering Graphics
ENG T 259	Engineering Graphics (SolidWorks II)
ENG T 193	Intermediate Catia
ENG T 217	CAD Projects

OTHER SUGGESTIONS

ACCT 110	Small Business Accounting
BUS& 101	Introduction to Business
BT 100	Beginning Keyboarding
BT 162	Job Search & Professional Development
BT 242	Excel
BT 243	Advanced Excel
IT 117	CCNA 1: Introduction to Networking
ECON 101	Understanding Economics
ENG T 104	Electro-mechanical Blueprint Reading
ENGR& 104 [OR BUS 102]	Introduction to Design
ENVS 150	Land Use Planning & Regulation
GRAPH 100	Intro to Digital Studio
GEOG 205	Physical Geography with GIS, GPS, and Remote Sensing labs
GIS 200	Introduction to Computer Cartography
GIS 201	Introduction to Geographic Information Systems
GIS 205	Applications in Geographic Information Systems
GIS 250	Internship in Geographic Information Systems
GIS 299	Independent Study – Visual Basic for GIS
GRAPH 110	Foundations of Graphic Design
GRAPH 113	Graphic Design and Typography
PHOTO 110	Photography I: Basic Elements

MATHEMATICS COURSES

You may select any Math course, Math 086 or higher. Math 095 and Math 131 are particularly recommended for the CAD degree.

SCIENCE COURSES

You may select any physics, chemistry, or engineering course

BUSINESS COURSES

You may select any business course