

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 Composites 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 – Composites Program is part of a cluster of programs. Four **Associate in Technical Arts degrees** and five **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 (all are 90 credits):

- **Advanced Manufacturing Tech – Composites**
 - **Advanced Manufacturing Tech – Precision Machining***
 - **Advanced Manufacturing Tech – Technical Design (CAD)***
 - **Advanced Manufacturing Tech - Welding and Fabrication***
- * Described in a separate guide.

Certificate Programs :

- **Manufacturing Pre-Employment (12 credits)**
 - **Composites (31 credits)**
 - **Precision Machining (40 credits)***
 - **Technical Design (CAD) (43 credits)***
 - **Welding and Fabrication (43 credits)***
- * 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 (such as fiber resin ratio)
- Learn basic hand skills for the layup of composite materials using fiberglass, carbon fiber, epoxy and polyester resin
- Design molds and forms for the layup of fiber glass and carbon fiber materials
- Build and vacuum bag composite materials for room temperature cure and oven cure materials
- Create projects in composite materials showing how surface energy is increased and decreased
- Design for producibility and manufacturing ease
- Document technical activities in written and verbal reports
- Be prepared for successful employment

In general, the Associate of Technical Arts (ATA) degree has limited transferability to a university for a bachelor’s degree. However, Central Washington University offers a Bachelor of Applied Science with a specialization in Administrative Management that accepts the ATA degree. Go to www.uceverett.org for more information.

CREDIT FOR PRIOR LEARNING

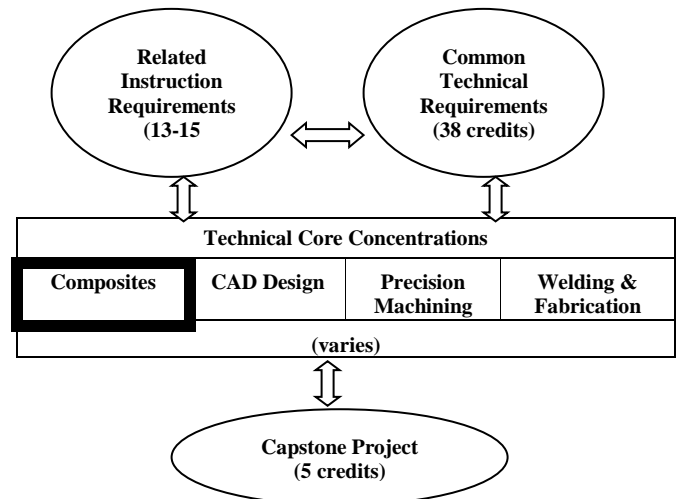
Adults with work experience or completion of industry training programs may be eligible for college credit by following “External Credit” evaluation procedures. Students currently in high school may take selected technical courses while in high school and apply at that time for college credit.

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 (13-15 credits), common technical requirements (38 credits), technical core concentration classes (20 to 40 credits), 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 20-40 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:

Educational Planning Center	425-388-9339
Enrollment Services	425-388-9219
BS at CWU (Paddy Chamberlain)	425-259-8904
Precision Machining (Terry Elmore)	425-388-9964 ext. 7374
CAD (Pheeson Liaw)	425-267-0160
CAD (Robert Osnes)	425-388-9383
Welding (Dan Minzel)	425-388-9447
Composites (Pat Murphy)	425-388-9534

ATA Degree: Advanced Manufacturing Tech – Composites

90 credits

The courses required for an **Associate in Technical Arts Degree in Advanced Manufacturing Tech – Composites** 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, each of these courses must be completed with a grade of 2.0 or higher.

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

COMPLETION of Diversity Course (BUS 110D, CMST 204 or HDEV 201D suggested):

<u>Course Number</u>	<u>Course Title</u>	<u>Credits</u>	(Where Completed/Course Title)	(Year Completed)	(Grade)
			<u>Quarter Planned</u>	<u>Quarter completed</u>	<u>Grade</u>
RELATED INSTRUCTION (13-15 credits)					
ENG T 101 (or MATH 091 and 092 OR 098, 099 or higher)*	Introduction to Graphics and Measurements	5	_____	_____	_____
ENGL 098 or ENGL& 101	Intro to College Writing or English Composition I	5	_____	_____	_____
BUS 110D, BUS 165, CMST& 210, CMST 230, CMST 204D, HDEV 155	Human Relations (R) course taken from this group:	3-5	_____	_____	_____
COMMON TECHNICAL REQUIREMENTS (38 credits)					
CL 101	Computer Literacy	5	_____	_____	_____
HLTH 141 (or WELD 154)	Industrial Safety	3	_____	_____	_____
ENG T 100	Engineering Graphics 2D AutoCAD I	4	_____	_____	_____
ENG T 102 (or PHYS 102/MATH& 141)	Technical Problem Analysis	5	_____	_____	_____
ENG T 105	Precision, Fits, Tolerancing and GD&T (CAD based)	4	_____	_____	_____
ENGR& 114 (or ENG T 108)	Engineering Graphics (Solid Works I)	4	_____	_____	_____
ENG T 213 (or PHYS 102/ MATH& 141)	Pneumatic, Hydraulic and Electrical Circuits	5	_____	_____	_____
ENG T 230, WELD 151 or WELD 152 *	Materials & Processes Class	3	_____	_____	_____
MFG T 202	Operations Management	5	_____	_____	_____
COMPOSITES TECHNICAL CORE REQUIREMENTS* (31 credits minimum)					
CT 111	Math and Physics	4	_____	_____	_____
CT 122	Weight and Balance	2	_____	_____	_____
CT 161	Materials and Processes	5	_____	_____	_____
CT 202	Composites	5	_____	_____	_____
CT 120	Composite Fabrication	4	_____	_____	_____
CT 125	Composite Assembly	4	_____	_____	_____
CT 130	Composite Repair	4	_____	_____	_____
CT 145	Composite Special Projects	3	_____	_____	_____
TECHNICAL ELECTIVES (9-11 credits minimum - see last page for suggestions)					
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
CAPSTONE PROJECT REQUIREMENTS (5 credits – required for completion of ATA degree. Follows all other classes.)					
MFG T 229	Manufacturing Team Project	5	_____	_____	_____
ENGR 298	Interdisciplinary Design Project	5	_____	_____	_____
MINIMUM REQUIRED CREDITS		90	Min 2.0 cumulative GPA		

* If you already have the certificate, note that this class was embedded in the certificate and you don't need to take it. Caution: you must take CT 111 and CT 122 to qualify for the certificate; ENG T 101 does not substitute in for these classes to obtain the certificate.

Aerospace Composite Technician Certificate

GENERAL INFORMATION

The Aerospace Composite Technician certificate is a two-quarter program designed to prepare students to fabricate, assemble, and repair composite materials on aircraft.

The knowledge and skills gained through this program are those required for entry-level positions as composite technicians. The certificate also provides an opportunity for existing aircraft mechanics and service technicians to expand their education in the field of composite assembly and repair.

Program start dates: Summer and Winter Quarters

GETTING STARTED AT EVCC

Our Enrollment Services Office provides information about application, advising, orientation and registration for new and continuing students. All prospective students are invited to contact the Educational Planning Center if they would like to speak one-to-one with an Educational Planner. 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
- ◆ Educational Planning Center, 3rd Floor, Parks Student Union, 425-388-9339

PROGRAM OUTCOMES

- Solve technical mathematical problems (such as fiber resin ratio)
- Learn basic hand skills for the layup of composites materials using fiberglass, carbon fiber, epoxy and polyester resin
- Design molds and forms for the layup of fiberglass and carbon fiber materials
- Build and vacuum bag composite materials for room temperature cure and oven cure materials
- Create projects in composite materials showing how surface energy is increased and decreased
- Design for producibility and manufacturing ease
- Document technical activities in written and verbal reports
- Be prepared for successful employment

PROGRAM ADVISOR

For specific guidance about this certificate, contact:

- ◆ Patrick Murphy, 425-388-9534
pmurphy@everettcc.edu

Certificate: Aerospace Composite Technician

This checklist can be used to plan your coursework. Please note that courses have prerequisites, which are listed in the schedule and catalog. All courses are not offered each quarter. Students who have successfully completed courses in the Aviation program with the same titles as the courses listed in Quarter One, but with the AVA prefix, may be able to use those courses toward certificate completion. Students with current FAA Mechanic's licenses should contact the program advisor for potential advanced placement prior to registration.

SPECIAL NOTE: Courses successfully taken in the Composites sequence may not be eligible as credit within the college's FAA approved Part 147 school. Contact the Aviation Advisor for more information prior to taking this coursework.

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 Completed	Grade
QUARTER ONE:					
CT 111	Math and Physics	4	_____	_____	_____
CT 122	Weight and Balance	2	_____	_____	_____
CT 161	Materials and Processes	5	_____	_____	_____
CT 202	Composites	5	_____	_____	_____
QUARTER TWO:					
CT 120	Composite Fabrication	4	_____	_____	_____
CT 125	Composite Assembly	4	_____	_____	_____
CT 130	Composite Repair	4	_____	_____	_____
CT 145	Composites Special Projects	3	_____	_____	_____
TOTAL: 31 credits			Minimum 2.0 minimum GPA		

Manufacturing Pre-Employment Certificate

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

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- ◆ Enrollment Services, Parks Student Union, 425-388-9219
admissions@everettcc.edu
- ◆ Educational Planning Center, 3rd Floor, Parks Student Union, 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:

- ◆ Annette Floyd, 425-388-9562
afloyd@everettcc.edu

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 Complete	Grade
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REQUIRED COURSE:

MFG T& 100	Manufacturing Employment Readiness	12	_____	_____	_____
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TOTAL: 12 credits Minimum 2.0 GPA

This certificate satisfies the requirements for HLTH 141/WELD 154 and Technical Electives of the Advanced Manufacturing ATA Degree.

Everett Community College does not discriminate on the basis of race, religion, creed, color, national origin, age, sex, sexual orientation, marital status, the presence of any physical, sensory or mental disability, genetic information or status as a disabled or Vietnam era veteran in its program and activities, or employment. The Vice President of Instruction and Student Services has been designated to handle inquiries regarding student-related non-discrimination policies and can be reached at 2000 Tower Street, Everett, WA 98201, or by phone at (425)388-9216. The Vice President of Administrative Services/Human Resources has been designated to handle employment-related inquiries regarding the non-discrimination policies and can be reached at 2000 Tower Street, Everett, WA 98201, or by phone at (425)388-9232. This publication is effective June 2012. 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

RECOMMENDED SEQUENCE OF COURSES

The courses required for a degree have been listed below in a suggested sequence for students who start their classes in Summer or Winter, and who wish to complete a degree in two years. Note that the certificate is a subset of the degree, and classes should be scheduled accordingly. Students should make certain they have met or completed the prerequisites before enrolling in these classes. In general, these prerequisites are: 1) The Pre-Employment certificate; or 2a) DEVED 096 for students not familiar with computers, 2b) Math 070 to enroll in ENG T 101, and 2c) ENGL 097 to enroll in ENGL 098 – consult with an adviser if unsure. EvCC does not offer every course each quarter, so please consult a class schedule and an advisor to plan any custom course selections.

SUMMER QUARTER START - FIRST YEAR

<i>Summer Quarter</i>		<i>Fall Quarter</i>		<i>Winter Quarter</i>		<i>Spring Quarter</i>	
<u>Course</u>	<u>Credit</u>	<u>Course</u>	<u>Credit</u>	<u>Course</u>	<u>Credit</u>	<u>Course</u>	<u>Credit</u>
CT 111	4	CT 120	4	ENG T 100	4	ENGR 114/ENG T 108	4
CT 122	2	CT 125	4	CL 101	5	ENG T 102	5
CT161	5	CT 130	4	ENGL 098	5	HUMAN RELATIONS	5
CT 202	5	CT 145	3				
Total	16	Total	15	Total	14	Total	14

SUMMER QUARTER START - SECOND YEAR

<i>Summer Quarter</i>		<i>Fall Quarter</i>		<i>Winter Quarter</i>		<i>Spring Quarter</i>	
<u>Course</u>	<u>Credit</u>	<u>Course</u>	<u>Credit</u>	<u>Course</u>	<u>Credit</u>	<u>Course</u>	<u>Credit</u>
ELECTIVES	5	ENG T 105	4	ENG T 213	5		
		MFG T 202	5	ELECTIVES	4		
		HLTH 141/WELD 154	3	MFG T 229/ENGT 199	5		
Total	5	Total	12	Total	14	Total	

WINTER QUARTER START - FIRST YEAR

<i>Summer Quarter</i>		<i>Fall Quarter</i>		<i>Winter Quarter</i>		<i>Spring Quarter</i>	
<u>Course</u>	<u>Credit</u>	<u>Course</u>	<u>Credit</u>	<u>Course</u>	<u>Credit</u>	<u>Course</u>	<u>Credit</u>
				CT 111	4	CT 120	4
				CT 122	2	CT 125	4
				CT161	5	CT 130	4
				CT 202	5	CT 145	3
Total		Total		Total	16	Total	15

WINTER QUARTER START - SECOND YEAR

<i>Summer Quarter</i>		<i>Fall Quarter</i>		<i>Winter Quarter</i>		<i>Spring Quarter</i>	
<u>Course</u>	<u>credit</u>	<u>Course</u>	<u>credit</u>	<u>Course</u>	<u>credit</u>	<u>Course</u>	<u>credit</u>
ENGL 098	5	ENG T 100	4	ENGR 114/ENG T 108	4	ENG T 105	4
ELECTIVES	9	CL 101	5	MFG T 202	5	ENG T 213	5
		HLTH 141/WELD 154	3	ENG T 102	5	MFG T 229/ENGR 298	5
		HUMAN RELATIONS	5				
Total	14	Total	17	Total	14	Total	14

GRADUATION

In order to receive the actual certificate or degree in a timely fashion, students are encourage to apply for graduation 12 weeks before they have completed their class work. Typically, this means the application process should be undertaken near the beginning of the quarter preceding the student's last quarter in school. The documents needed are as follows:

1. The graduation application form, which is available on the EvCC web site. The student fills this out and signs it.
2. The curriculum guide (page 2 or 3 or 4), which is available on the EvCC web site. The student fills out the dates and grades for all classes taken and the projected dates for those not yet taken. The student and the faculty adviser sign this document.
3. If any classes listed on the curriculum guide were waived or substituted, the Waiver and Substitution form must be filled out. See your faculty adviser to obtain a copy of this document. The student, faculty adviser, and the division dean sign this document.

When these documents have been filled out and signed, the student should then make a copy of them for their records, and then submit the original documents to Enrollment Services.

DEGREE ELECTIVES

You must complete at least 9 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.

PRECISION MACHINING

MFG T 104 Machine Operator I
MFG T 105 Machine Operator II

Technical Design (CAD)

ENG T 203 Intermediate AutoCAD
ENG T 259 Engineering Graphics (SolidWorks II)
ENG T 185 Introduction to Catia
ENG T 193 Intermediate Catia
ENG T 217 CAD Projects

WELDING/FABRICATION TECHNOLOGY

WELD 111 Basic Layout
WELD 151 Carbon Steel Metallurgy for the Trades
WELD 152 Welding Base Materials: Processes & Procedures
WELD 153 Non-Ferrous Metallurgy for the Trades
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 210 Heavy Plate Fabrication
WELD 211 Sheet Metal Fabrication
WELD 212 Pipefitting & Pipe Systems Fabrication
WELD 213 Practical Fabrication & Adv. Welding Techniques
WELD 214 Sub-Arc Welding
WELD 215 Press Brake
WELD 216 Advanced Tig Welding
WELD 225 Welding Skills Building
WELD 285 CNC Plasma Cutting
WELD 295 Work Experience Internship

OTHER SUGGESTIONS

BT 100 Beginning Keyboarding
ACCT 110 Small Business Accounting
BUS& 101 Introduction to Business
BT 162 Job Search & Professional Development
BT 242 Excel
BT 243 Advanced Excel
CS 117 Intro to Computer 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 Digital Illustration I
GRAPH 113 Digital Illustration II
PHOTO 110 Photography I: Basic Elements

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

MATHEMATICS COURSES

You may select any Math course, Math 080 or higher. Math 095 and Math 105 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

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