**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 Precision Machining 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 – Precision Machining 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 (all are 90 credits):**
- Advanced Manufacturing Tech – Precision Machining
- Advanced Manufacturing Tech – Technical Design (CAD)*
- Advanced Manufacturing Tech – Composites*
- Advanced Manufacturing Tech - Welding and Fabrication*
* Described in a separate guide.

**Certificate Programs :**
- Manufacturing Pre-Employment (12 credits)
- Precision Machining (40 credits)
- Engineering Technology (CAD) (39 credits)*
- CATIA v5 (27 credits)*
- Composites (31 credits)*
- Welding and Fabrication (43 credits)*
- Mechatronics (19 credits)
- Introduction to Composites (5 credits)*
- Introduction to Robotics (5 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
- Read and understand basic engineering drawings
- Understand and utilize machine technology
- Write programs and setup CNC machines
- Operate and perform maintenance on CNC machines
- Document technical activities in written and verbal reports
- Be prepared for successful employment

**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 (28 credits), technical core concentration classes (31 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 425-388-9339
- Enrollment Services 425-388-9219
- Precision Machining 425-388-9570
- CAD (David Primacio) 425-267-0160
- Mechatronics (Ken Ackerman) 425-388-9290
- Welding (Robert White) 425-388-9547
- Composites (Michael Patching) 425-388-9092

Approved by Instructional Council November 2018
ATA Degree: Advanced Manufacturing Tech – Precision Machining  
90 credits

The courses required for an Associate in Technical Arts Degree in Advanced Manufacturing Tech – Precision Machining 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  
(BUS 110D, ENGL 098D or ENGL& 101D suggested)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
<th>Quarter Planned</th>
<th>Quarter completed</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG T 101 or MATH 086 or higher</td>
<td>Introduction to Graphics and Measurements</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGL 98/98D or ENGL&amp; 101/101D</td>
<td>Intro to College Writing or English Composition I</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BUS 110D, BUS 165, CMST&amp; 210,</td>
<td>Human Relation Course from this group.</td>
<td>5</td>
<td></td>
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</tr>
<tr>
<td>CMST&amp; 230</td>
<td>Business 110D recommended</td>
<td>5</td>
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</tbody>
</table>

COMMON TECHNICAL REQUIREMENTS (31 credits)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
<th>Quarter Planned</th>
<th>Quarter completed</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFG T 100 or MFG T 130</td>
<td>Safety for Manufacturing or OSHA 30 Safety</td>
<td>4</td>
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<td></td>
</tr>
<tr>
<td>CT 101</td>
<td>Introduction to Composites</td>
<td>5</td>
<td></td>
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</tr>
<tr>
<td>MFG T 117</td>
<td>Blueprint Reading and Schematics</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENG T 101 or higher</td>
<td>Engineering Graphics: 3D CAD</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MFG T 101 or MFG T 113*</td>
<td>Introduction to Machining</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WELD 101 or higher</td>
<td>Introduction to Welding</td>
<td>5</td>
<td></td>
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</tr>
<tr>
<td>MECH 119 or higher</td>
<td>Introduction to Robotics</td>
<td>5</td>
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</tbody>
</table>

PRECISION MACHINING TECHNICAL CORE REQUIREMENTS (40 credits)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
<th>Quarter Planned</th>
<th>Quarter completed</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFG T 104</td>
<td>Machine Operator I</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MFG T 105</td>
<td>Machine Operator II</td>
<td>20</td>
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</tr>
</tbody>
</table>

TECHNICAL ELECTIVES (2 - 12 credits - see last page for additional suggestions)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
<th>Quarter Planned</th>
<th>Quarter completed</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFG T 102 (recommended)</td>
<td>Manufacturing Employment Readiness</td>
<td>12</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

CAPSTONE PROJECT REQUIREMENTS (5 credits – select one class from the list below. Generally follows all other classes.)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
<th>Quarter Planned</th>
<th>Quarter completed</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFG T 229 or MFG T 171</td>
<td>Manufacturing Team Project</td>
<td>5</td>
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</tr>
</tbody>
</table>

MINIMUM REQUIRED CREDITS 90 Min 2.0 cumulative GPA

* If you already have the certificate, this class was embedded in the certificate and you don't need to take it. Additionally, the following courses may be substituted for MFG T 101: MFG T 107, 119, 113 or 202.

Interested in transferring to a university?

Students completing this ATA degree can transfer directly to the Information Technology and Administratative Management (ITAM) program at Central Washington 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](http://www.cwu.edu/it-management/bas-overview) or [www.cptc.edu/programs/basmo](http://www.cptc.edu/programs/basmo) for more information.

Everett Community College does not discriminate based on, but not limited to, race, color, national origin, citizenship, ethnicity, gender, 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 APRIL 2019. 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](http://www.everettcc.edu).
Principles of Precision Machining: Certificate

GENERAL INFORMATION
The Principles of Precision Machining Certificate program is designed to provide students with the basic skills necessary to gain employment as machine operators. Students will develop skills in applied machining including basic math, basic and advanced blueprint reading, conventional lathe and mill operations, small shop tools and operation, shop safety and teamwork. This certificate may be considered a stand-alone credential for people seeking to enter the Precision Machining field, or as part of a stackable set of certificates and degrees in the EvCC Advanced Manufacturing Program leading to a degree in Precision Machining.

There is a current need in Washington for more than 1,000 CNC operators. Graduates of this certificate program may work in companies of different sizes, from small shops to large aerospace companies. Indicators show the industry will remain strong beyond the year 2020.

PROGRAM INFORMATION
The two- quarter program will focus on skills used in a modern machine shop. The first quarter focuses on machine shop math, blueprint reading, and conventional machine tool theory and lab. CNC is introduced. The second quarter builds upon skills gained in the first quarter, adds in geometric dimension and tolerance, applied math skills including geometry and trigonometry, and more CNC programming and operations.

PROGRAM OUTCOMES
- Solve technical mathematical problems
- Read and understand basic engineering drawings
- Understand and utilize machine technology
- Write programs and setup CNC machines
- Operate and perform maintenance on CNC machines
- Document technical activities in written and verbal reports
- Be prepared for successful employment

COURSE INFORMATION
MFG T 104 Machine Operator 1
Applied machinist math including measurements, basic blueprint reading, conventional lathe and mill operations, small shop tools operation and an introduction to CNC. Students are introduced to processes and procedures, and shop safety and teamwork.

MFG T 105 Machine Operator 2
Develops skills in advanced blueprint reading including understanding of Geometric Dimensioning and Tolerance; applied math skills including geometry and trigonometry; technical core skills in CNC Machine programming and operation are further developed.

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

PROGRAM ADVISORS
For specific guidance about this certificate, contact:
- AMTEC
  425-388-9570
  mfg@everettcc.edu

Certificate: Principles of Precision Machining (40 Credits)
This checklist is targeted at students with an interest CNC operator and machinist. Courses have prerequisites. Upon enrollment, this checklist should be submitted with a diploma application to the Enrollment Services Office.

Student: _____________________________ Advisor: _____________________________ Date: _____________

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
<th>Quarter Planned</th>
<th>Quarter Done</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFG T 104</td>
<td>Machine Operator 1</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MFG T 105</td>
<td>Machine Operator 2</td>
<td>20</td>
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</tbody>
</table>

TOTAL: 40 credits  Minimum 2.0 GPA

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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
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 Room 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

For specific guidance about this certificate, contact:

♦ AMTEC
  425-388-9570
  mfg@everettcc.edu

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

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: _____________

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
<th>Quarter Planned</th>
<th>Quarter Done</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFG T 102</td>
<td>Manufacturing Employment Readiness</td>
<td>12</td>
<td>________</td>
<td>____________</td>
<td></td>
</tr>
</tbody>
</table>

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.

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DEGREE ELECTIVES

You may complete 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.

COMPOSITES 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

MANUFACTURING TECHNOLOGY

MFG T 102 Manufacturing Employment Readiness
MFG T 107 Machining with Mastercam
MFG T 113 CNC Cutting Solutions
MFG T 202 Lean and Operations Management

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
ENG T 259 Engineering Graphics (SolidWorks II)
ENG T 193 Intermediate Catia
ENG T 217 CAD Projects

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
IT 117 CCNA 1: Introduction to Networking
ECON 101D Understanding Economics
ENG T 104 Mechanical Blueprint Reading
ENGR& 104 or Introduction to Design
BUS 102
GEOG 205 Physical Geography with GIS, GPS, and Remote Sensing labs
GRAPH 100 Intro to Digital Studio
GRAPH 110 Foundations of Graphic Design
GRAPH 113 Graphic Design and Typography
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 make take any human relations course listed on page 2

INTERNSHIP

MFG T 171
MFG T 172

MATHEMATICS COURSES

MATH 086 is particularly recommended for the degree if you haven’t taken a higher level course in Technical Geometry and Trigonometry.

SCIENCE COURSES

You may select any physics, chemistry, or engineering course

BUSINESS COURSES

You may select any business course