

Advanced Manufacturing Technology Technical Design (CAD)

GENERAL INFORMATION

Everett Community College offers a number of pathways toward technical careers. The Advanced Manufacturing Technology program offers a two year Associate in Technical Arts (ATA) degree or a shorter term certificate to students seeking entry into or career advancement in the advanced manufacturing sector of the job market. It is designed to prepare students for careers in areas such as welding and fabrication, project management, composites design/repair, CAD based design technology, or a position coordinating all these activities. Students already working in manufacturing could select certain electives and a study path in consultation with their employers to better prepare them for lead and supervisory positions. 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 – Technical Design (CAD) Program is part of a cluster of programs. Three **Associate in Technical Arts degrees** and three **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 – Technical Design (CAD)**
 - **Advanced Manufacturing Tech – Composites***
 - **Advanced Manufacturing Tech - Welding and Fabrication***
- * Described in a separate guide.

Certificate Programs :

- **Technical Design (CAD) (44 credits)**
 - **Composites (36 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
- Utilize basic engineering graphics with 2D CAD
- Create multi-view drawings using 2D and 3D CAD
- Create assembly drawings from 3D models
- Create complex surfaced part models using 3D CAD
- 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

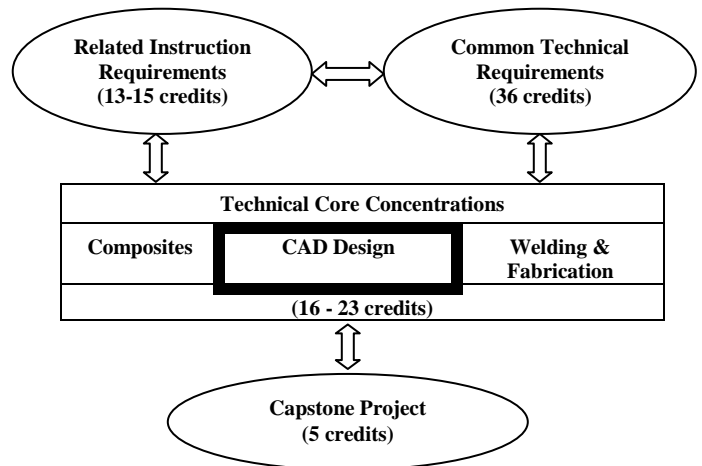
Adults with work experience or completion of industry training programs may be eligible for college credit by following "External Credit" evaluation procedures. Students currently in high school may take selected technical courses while in high school and apply at that time for college credit.

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 (36 credits), technical core concentration classes (16 to 23 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 16-23 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
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 – Technical Design (CAD)

90 credits

The courses required for an **Associate in Technical Arts Degree in Advanced Manufacturing Tech – Technical Design (CAD)** 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.

Courses listed with an ampersand in the course number (e.g. ENGL&101) reflect the new Common Course Numbering System.

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

COMPLETION of Diversity Course (BUS 110D suggested):

(Where Completed/Course Title) (Year Completed) (Grade)

<u>Course Number</u>	<u>Course Title</u>	<u>Credits</u>	<u>Quarter Planned</u>	<u>Quarter completed</u>	<u>Grade</u>
RELATED INSTRUCTION (13-15 credits)					
ENG T 101 (or MATH 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 (36 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 **	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 112 (or PHYS 102 or higher)	Pneumatic, Hydraulic and Electrical Circuits	5	_____	_____	_____
ENG T 230 (or CHEM&140 or higher)	Manufacturing Materials & Processes	3	_____	_____	_____
MFG T 110	Introduction to Manufacturing	3	_____	_____	_____
COMPUTER AIDED DESIGN TECHNICAL CORE REQUIREMENTS (16 credits)					
ENG T 185	Introduction to CAD with Catia v5	4	_____	_____	_____
ENG T 193	Intermediate CAD with Catia v5	4	_____	_____	_____
ENG T 203	Computer Aided Design: 2D AutoCAD II	4	_____	_____	_____
ENG T 259	Engineering Graphics: 3D CAD-CAM (Solid Works II)	4	_____	_____	_____
TECHNICAL ELECTIVES (18-20 credits - see page 5 for suggestions)					
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
CAPSTONE PROJECT REQUIREMENTS (5 credits – select one class from the list below. Generally follows all other classes.)					
MFG T 229	Manufacturing Team Project	5	_____	_____	_____
ENGR 298	Interdisciplinary Design Project	5	_____	_____	_____

MINIMUM REQUIRED CREDITS 90 Min 2.0 cum. GPA

* Students seeking the Welding and Fabrication pathway in this degree may substitute MATH 075 and WELD 150 for ENG T 101
 ** Students may substitute MATH 141 or higher, or PHYS 102 or higher, for ENG T 102

Certificate: Advanced Manufacturing Tech – Technical Design (CAD)

44 credits

The courses required for a **Certificate in Advanced Manufacturing Tech – Technical Design (CAD)** 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.

Courses listed with an ampersand in the course number (e.g. ENGL&101) reflect the new Common Course Numbering System.
 Courses in [brackets] are the "old" course numbers and may be used to satisfy requirements. For more information, go to www.everettcc.edu/ccn

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

<u>Course Number</u>	<u>Course Title</u>	<u>Credits</u>	<u>Quarter Planned</u>	<u>Quarter completed</u>	<u>Grade</u>
ENG T 101 (or Math 099 or higher)*	Introduction to Graphics and Measurements	5	_____	_____	_____
ENGL 098 or ENGL& 101	Intro to College Writing or English Composition I	5	_____	_____	_____
ENG T 100	Introduction to Engineering Graphics 2D (AutoCAD I)	4	_____	_____	_____
ENG T 105	Precision, Fits, Tolerances and GD&T (CAD based)	4	_____	_____	_____
ENGR& 114 (or ENG T 108)	Engineering Graphics (Solid Works I)	4	_____	_____	_____
ENG T 185	Introduction to CAD with Catia v5	4	_____	_____	_____
ENG T 193	Intermediate CAD with Catia v5	4	_____	_____	_____
ENG T 203	Computer Aided Design: AutoCAD II	4	_____	_____	_____
ENG T 230	Manufacturing Materials & Processes	3	_____	_____	_____
ENG T 259	Engineering Graphics: 3D CAD-CAM (Solid Works II)	4	_____	_____	_____
HLTH 141 (or Weld 154)	Industrial Safety	3	_____	_____	_____
MINIMUM REQUIRED CREDITS		44		Min 2.0 cum. GPA	

* Students seeking the Welding and Fabrication pathway in this degree may substitute MATH 075 and WELD 150 for ENG T 101

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), 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.

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 either **Fall** or **Winter Quarter**, and who wish to complete a degree in two years or less. 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) DEVED 096 for students not familiar with computers, 2) Math 070 to enroll in ENG T 101, and 3) ENGL 097 to enroll in ENGL 098 – consult with an adviser if unsure. EvCC does not offer every course each quarter, so if you plan to begin your courses in spring or summer, or you plan in some other way to deviate from these schedules, please consult with your adviser to devise a custom schedule to meet your goals.

FALL QUARTER START - FIRST YEAR

<i>FALL QUARTER</i>		<i>WINTER QUARTER</i>		<i>SPRING QUARTER</i>	
<u>Course</u>	<u>Credits</u>	<u>Course</u>	<u>Credits</u>	<u>Course</u>	<u>Credits</u>
ENG T 101	5	ENG T 203	4	ENG T 105	4
ENG T 100	4	ENGR& 114 OR ENG T 108	4	ENG T 259	4
CL 101	5	ENG T 102	5	ENGL 098	5
TOTAL	14	TOTAL	13	TOTAL	13

SUMMER QUARTER

<u>Course</u>	<u>Credits</u>
HUMAN RELATIONS (D)	5
ELECTIVE	5
TOTAL	10

FALL QUARTER START - SECOND YEAR

<i>FALL QUARTER</i>		<i>WINTER QUARTER</i>		<i>SPRING QUARTER</i>	
<u>Course</u>	<u>Credits</u>	<u>Course</u>	<u>Credits</u>	<u>Course</u>	<u>Credits</u>
ENG T 185	4	ENG T 193	4	MFG T 229/ENGR 298	5
MFGT 110	3	ENG T 112	5	HLTH 141/WELD 154	3
ENG T 230	3	ELECTIVE	5	ELECTIVE	3
ELECTIVE	5	TOTAL	14	TOTAL	11
TOTAL	15				

WINTER QUARTER START - FIRST YEAR

<i>WINTER QUARTER</i>		<i>SPRING QUARTER</i>		<i>SUMMER QUARTER</i>	
<u>Course</u>	<u>Credits</u>	<u>Course</u>	<u>Credits</u>	<u>Course</u>	<u>Credits</u>
ENG T 100	4	ENG T 203	4	ENGL 098	5
ENG T 101	5	ENG T 102	5	ELECTIVE	5
CL 101	5	ENGR& 114 OR ENG T 108	4		
TOTAL	14	TOTAL	13	TOTAL	10

WINTER QUARTER START - SECOND YEAR

<i>FALL QUARTER</i>		<i>WINTER QUARTER</i>		<i>SPRING QUARTER</i>	
<u>Course</u>	<u>Credits</u>	<u>Course</u>	<u>Credits</u>	<u>Course</u>	<u>Credits</u>
ENG T 105	4	ENG T 185	4	MFG T 229/ENGR 298	5
ENG T 259	4	MFGT 110	3	ENG T 193	4
HLTH 141/WELD 154	3	ENG T 230	3	ENG T 112	5
ELECTIVE	5	ELECTIVE	5		
TOTAL	16	TOTAL	15	TOTAL	14

SUMMER QUARTER

<u>Course</u>	<u>Credits</u>
HUMAN RELATIONS (D)	5
ELECTIVE	3
TOTAL	8

DEGREE ELECTIVES

You must complete at least 18 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.

Courses listed with an ampersand in the course number (e.g. ENGL&101) reflect the Common Course Numbering System.
. For more information, go to www.everettcc.edu/ccn

COMPOSITES TECHNOLOGY*

CT 101	Introduction to Composites
CT 121	Materials Used in Composites
CT 201	Design and Manufacture of Composite Materials
CT 221	Inspection and Repair of Composite Materials

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 TECHNICAL SUGGESTIONS

ACCT 110	Small Business Accounting
BUS& 101	Introduction to Business
BUS 105	Small Business Essentials
BUS 154	Fundamentals of Supervision
BT 100	Beginning Keyboarding
BT 162	Job Search and 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

MATHEMATICS COURSES

You may select any Math course, Math 080 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.

INTERNSHIP

MFG T 171
MFG T 172

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 JANUARY 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