

Advanced Manufacturing Technology Technical Design (CAD)

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 Technical Design discipline.

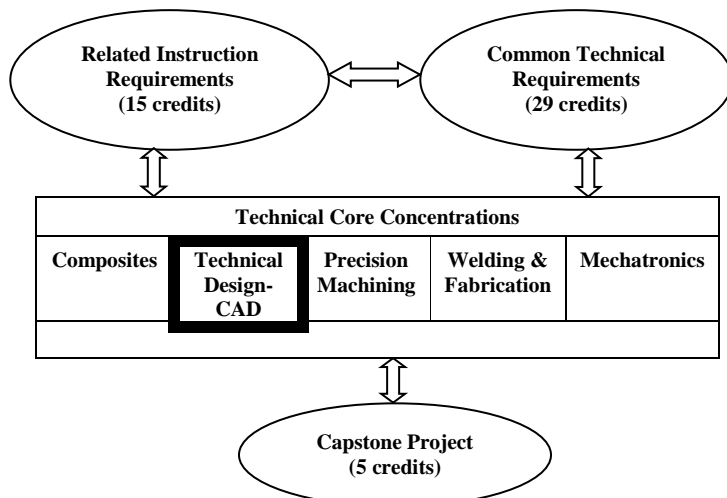
The overall program is designed for maximum flexibility, in that one may choose to take one or two courses to enhance their current skills, or pursue a certificate or degree, depending on their goals. The program outcomes for students pursuing this degree will prepare them to perform the following tasks:

- 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

THE PROGRAM

The Advanced Manufacturing Technology – Technical Design (CAD) Program is part of a cluster of disciplines, which also includes Composites, Mechatronics, Precision Machining, and Welding. See the college web site for further information.

The courses for this program may be divided into four categories: related instruction requirements (15 credits), common technical classes (29 credits), and technical core concentration classes (40 to 46 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 if needed, until the total credit accumulations meets or exceeds the degree requirement. The actual courses are listed further on in this curriculum guide. See the diagram below for an understanding of how the courses interrelate.



ADMISSION AND PROGRAM REQUIREMENTS

Admission to the degree program requires that the students place into MATH or TS 076 or higher and ENGL or TS 098 or higher, and be able to read, write, speak and understand the English language (ESL/ABE level 5). In addition, students should meet computer literacy requirements including file management and typing. The Technical Design (CAD) program provides information sessions throughout the year, attendance is recommended for prospective and new students. Please contact us at 425-388-9570 for information session dates and times or view the schedule at www.everettcc.edu/cad.

Prior to enrollment, students should complete placement testing and meet with an advisor.

Placement testing is available at the Testing Center on the main campus or students may take the CASAS assessment administered at the AMTEC facility. Check the website at www.everettcc.edu/cad or call 425-388-9570 for information on the CASAS test.

GETTING STARTED AT EVCC

The Enrollment Services Office, located in the Parks Student Union, provides many services for new, continuing and former students including registering for classes, applying for graduation, or locating grades, assistance is available in person or at 425-388-9219. Prospective students should complete the GETTING STARTED CHECKLIST at Everettcc.edu/getstarted

PROGRAM ADVISORS

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

CREDIT FOR PRIOR LEARNING

Adults with work experience may be eligible for college credit by following the “Prior Experiential Learning” evaluation procedures. To start the Portfolio Review process, contact the Prior Learning Assessment Manager, Maureen O’Shaughnessy at 425-388-9071. Students currently in high school may take selected technical courses while in high school and apply at that time for college credit. Contact your high school counselor or www.everettcc.edu/techprep.

UNIVERSITY TRANSFER OPTIONS

Students completing this ATA degree have several transfer degree options; for more information visit everettcc.edu/amtec.



Advanced Manufacturing Tech - Technical Design (CAD) ATA Degree

The courses required for an **Associate in Technical Arts Degree in Advanced Manufacturing Tech – Technical Design (CAD)** are listed below. Note that program pre-requisites should be met. 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. Everett Community College 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, CMST 204D or ENGL 098D/&101D suggested) (Quarter 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 (15 credits)					
ENG T 101 (or MATH 086 or higher)	Introduction to Technical Problem Solving	5	_____	_____	_____
ENGL 98/98D or ENGL& 101/101D	Intro to College Writing or English Composition I	5	_____	_____	_____
BUS 110D, BUS 165, CMST& 210, CMST 230, or CMST 204D	Human Relations (R) course from this group BUS 110D/ CMST 204D Recommended	5	_____	_____	_____
COMMON TECHNICAL REQUIREMENTS (29 credits)					
ENG T 100 (or higher)	Introduction to Engineering Graphics CAD	4	_____	_____	_____
MFG T 100	Preparation for Success and Safety in Industry	5	_____	_____	_____
CT 101 (or higher)	Introduction to Composites	5	_____	_____	_____
MFG T 101 (or higher)	Introduction to Machining	5	_____	_____	_____
WELD 101 (or higher)	Introduction to Welding	5	_____	_____	_____
MECH 119 (or higher)	Introduction to Robotics	5	_____	_____	_____
COMPUTER AIDED DESIGN TECHNICAL CORE REQUIREMENTS (20 credits)					
ENG T 108 (or ENGR& 114)	Engineering Graphics: 3D CAD (Solid Works 1)	4	_____	_____	_____
ENG T 185	Introduction to CATIA 3D Experience	4	_____	_____	_____
ENG T 204	Drafting using CAD	4	_____	_____	_____
ENG T 205	Precision, Fits, Tolerancing and GD&T	5	_____	_____	_____
ENG T 230 (or WELD 151)	Manufacturing Materials & Processes	3	_____	_____	_____
TECHNICAL ELECTIVES (Select 21 credits for this category)					
ENG T 102 (or MATH 092 or higher)	Technical Problem Analysis	5	_____	_____	_____
ENG T 103	Introduction to Revit	4	_____	_____	_____
ENG T 193	Intermediate CAD with CATIA 3D Experience	4	_____	_____	_____
ENG T 194	Tool Design and Product Structure	4	_____	_____	_____
ENG T 195	Advanced Surfacing with CATIA 3D Experience	4	_____	_____	_____
ENG T 196	Advanced Workbenches with CATIA 3D Experience	4	_____	_____	_____
ENG T 203	Computer Aided Design: 2D AutoCAD II	4	_____	_____	_____
ENG T 213 (or MATH 141 or higher)	Statics and Strength of Materials	5	_____	_____	_____
ENG T 217	Reverse Engineering CAD Design Project	4	_____	_____	_____
ENG T 225 (or ENG T 226)	CAD Skills Building I or II	2	_____	_____	_____
ENG T 259	Engineering Graphics: 3D CAD-CAM (Solid Works II)	4	_____	_____	_____
ENGR 101 (or higher)	College Success in Engineering	2	_____	_____	_____
MFG T 107 or MFG T 109	Introduction to NC Programming	4	_____	_____	_____
MFG T 202	Lean & Operations Management	5	_____	_____	_____
ENGL& 230 (or higher)	Technical Writing	3	_____	_____	_____
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		

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

Engineering Technology (CAD) Certificate

GENERAL INFORMATION

Advanced Manufacturing – Engineering Technology (CAD) Certificates are designed to provide the student with the foundational skills necessary to gain employment as a technical designer familiar with several design software packages in common use in industry.

Four certificates are offered. The first certificate – Engineering Technology (CAD) - offers recognition for those students who have taken classes in all of the EvCC CAD software. The remaining three certificates address specific CAD software. These certificates may be considered as stand-alone credentials for people seeking to gain entry level CAD employment, or as the first level of a stackable set of certificates in the Advanced Manufacturing Technology – Technical Design (CAD) Associates in Technical Arts degree pathway. Candidates should be aware that many businesses require a 2-year associate degree for employment in this field, and that this certificate by itself may not be sufficient to meet this goal.

CERTIFICATE & COURSE INFORMATION

These certificates contain modules on 3D design modeling, 2D geometric constructions, and 2D production drawings. Traditional orthographic view placements as well as dimensioning and tolerance standards are examined. Specific protocols like fastener applications, flat pattern development, weldments, and machining are explored. The CAD software packages used include AutoCAD, Solid Works, CATIA 3D Experience Revit and Mastercam CAD/CAM.

CERTIFICATE OUTCOMES

(these outcomes are a subset of the program outcomes)

- 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

PROGRAM ADVISORS

For specific guidance about this certificate, contact:

- David Primacio, 425-267-0160 dprimacio@everettcc.edu
- Sean Auger, 425-388-9534 sauger@everettcc.edu

Certificate: Engineering Technology (CAD) – 39 Credits

This checklist is targeted at students with an interest in a CAD technical design certificate and represents a subset of the classes required for an Associates in Technical Arts Degree. Note that program pre-requisites should be met before starting these classes. Students should meet with an advisor and maintain this checklist while at Everett Community College. Note that to earn this certificate each of these courses must be completed with a grade of 2.0 or higher.

Student: _____ Advisor Signature: _____ Date: _____

Course Number	Course Title	Credits	Quarter Planned	Quarter Done	Grade
ENG T 100	Intro to Engineering Graphics and 2D AutoCAD	4	_____	_____	_____
ENG T 108 (or ENGR& 114)	Engineering Graphics: 3D CAD (Solid Works 1)	4	_____	_____	_____
ENG T 185	Introduction to CATIA 3D Experience	4	_____	_____	_____
ENG T 204	Drafting using CAD	4	_____	_____	_____

TECHNICAL ELECTIVES

(Select classes from the list below to complete the remaining 23 credits):

ENG T 103	Introduction to Revit	4	_____	_____	_____
ENG T 193	Intermediate CAD with CATIA 3D Experience	4	_____	_____	_____
ENG T 194	Tool Design and Product Structure	4	_____	_____	_____
ENG T 195	Advanced Surfacing with CATIA 3D Experience	4	_____	_____	_____
ENG T 196	Advanced Workbenches with CATIA 3D Experience	4	_____	_____	_____
ENG T 203	Computer Aided Design: 2D AutoCAD II	4	_____	_____	_____
ENG T 205	Precision, Fits, Tolerancing and GD&T	5	_____	_____	_____
ENG T 217	Reverse Engineering CAD Design Project	4	_____	_____	_____
ENG T 225	Engineering Technology Skills Building	2	_____	_____	_____
ENG T 259	Engineering Graphics: 3D CAD-CAM (Solid Works II)	4	_____	_____	_____

TOTAL: 39 credits Minimum 2.0 GPA

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Certificate: AutoCAD - 12 Credits

This checklist is targeted at students with an interest in AutoCAD and represents a subset of the classes required for an Associates in Technical Arts Degree. Students should meet with an advisor and maintain this checklist while at Everett Community College. Note that to earn this certificate, each of these courses must be completed with a grade of 2.0 or higher.

Student: _____ Advisor Signature: _____ Date: _____

Course Number	Course Title	Credits	Quarter Planned	Quarter Done	Grade
ENG T 100	Introduction to Engineering Graphics and 2D AutoCAD	4	_____	_____	_____
ENG T 103	Introduction to Revit	4	_____	_____	_____
ENG T 203	Computer Aided Design: 2D AutoCAD II	4	_____	_____	_____
TOTAL:		12 credits	Minimum 2.0 GPA		

Certificate: Solid Works - 17 Credits

This checklist is targeted at students with an interest in Solid Works and represents a subset of the classes required for an Associates in Technical Arts Degree. Students should meet with an advisor and maintain this checklist while at Everett Community College. Note that to earn this certificate, each of these courses must be completed with a grade of 2.0 or higher.

Student: _____ Advisor Signature: _____ Date: _____

Course Number	Course Title	Credits	Quarter Planned	Quarter Done	Grade
ENG T 204	Drafting using CAD	4	_____	_____	_____
ENG T 205	Precision, Fits, Tolerancing and GD&T	5	_____	_____	_____
ENG T 108 (or ENGR& 114)	Engineering Graphics: 3D CAD (Solid Works I)	4	_____	_____	_____
ENG T 259	Engineering Graphics: 3D CAD-CAM (Solid Works II)	4	_____	_____	_____
TOTAL:		17 credits	Minimum 2.0 GPA		

Certificate: CATIA 3D Experience - 33 Credits

This checklist is targeted at students with an interest in CATIA 3D Experience technical design certificate and represents a subset of the classes required for an Associates in Technical Arts Degree. Students should meet with an advisor and maintain this checklist while at Everett Community College. Note that to earn this certificate, each of these courses must be completed with a grade of 2.0 or higher.

Student: _____ Advisor Signature: _____ Date: _____

Course Number	Course Title	Credits	Quarter Planned	Quarter Done	Grade
ENG T 185	Introduction to CATIA 3D Experience	4	_____	_____	_____
ENG T 193	Intermediate CAD with CATIA 3D Experience	4	_____	_____	_____
ENG T 194	Tool Design and Product Structure	4	_____	_____	_____
ENG T 195	Advanced Surfacing with CAITA 3D Experience	4	_____	_____	_____
ENG T 196	Advanced Workbenches with CATIA 3D Experience	4	_____	_____	_____
ENG T 204	Drafting using CAD	4	_____	_____	_____
ENG T 205	Precision, Fits, Tolerancing and GD&T	5	_____	_____	_____
ENG T 217	Reverse Engerineeing CAD Design Project	4	_____	_____	_____
TOTAL:		33 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 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:

David Primacio,
425-267-0160
dprimacio@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 Done	Grade
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REQUIRED COURSES

MFG T 102	Manufacturing Employment Readiness	12			
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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