

COMPUTER AIDED DESIGN

Computer aided design (CAD) is an advanced product development tool used in all manufacturing which allows engineers, designers, and technicians to develop new products faster with increased precision by automating many complex, tedious, and repetitive design tasks. Traditional technical drawing theory and practices are utilized alongside the most up-to-date CAD applications, rapid prototyping machines, modeling simulators, and other high-tech commodities.

Entrance Requirements

None

Program Requirements

None

- Demonstrate a professional level of mastery (passing class w/ 70%+) of the technical drawing and/or modeling theory in each of the theory classes contained in the educational plan for the desired degree/certificate.
- Demonstrate a professional level of mastery (passing class w/ 70%+) of the pertaining software application use in each of the classes contained in the educational plan for the desired degree/certificate.
- Demonstrate a professional level (passing class w/ 70%+) of familiarity of manufacturing processes and materials. (AAS only)

Computer Aided Design - Associate of Applied Science

Course	Title	Credit Hours
First Semester		
CAD 101 or EGR 101	Introduction to Engineering Design or Engineering Design Graphics/Cad	4
CAD 120	Introduction to SolidWorks	3
IMT 103	Industrial Manufacturing Tech I	3
IMT 104	Industrial Manufacturing Tech II	3
ENG 101 or BUS 101	English Composition I or Business Communications I	3
Total		16
Second Semester		
CAD 121	Advanced Concepts in SolidWorks	3
CAD 206	Industrial Design Problems	4
ENG 102 or BUS 142	English Composition II or Business Communications II	3
Required Math/Science Course		3
IMT 112	Metrology-The Study of Measurement	3
Total		16
Third Semester		
Social/Behavioral Science Requirement		
CAD 108	Intro to Micro-CAD AutoCAD	3
CAD 118	Computer Graphics Advanced AutoCAD	3
CAD 105	Introduction to Creo	3
Required Humanities/Fine Arts Course		3
Total		15

Fourth Semester

CAD 111	Advanced Concepts in Creo	3
CAD 208	Applied Descriptive Geometry & Statics	4
CAD 205	Geometric Dimensioning & Tolerancing	3
CAD 110	Introduction to Inventor & 3D Printing	3
WEL 101	Welding I	2.5
Total		15.5
Program Total		62.5

Computer Aided Design - Basic Vocational Specialist

Course	Title	Credits
EGR 101 or CAD 101	Engineering Design Graphics/Cad Introduction to Engineering Design	4
CAD 105	Introduction to Creo	3
CAD 108	Intro to Micro-CAD AutoCAD	3
CAD 206	Industrial Design Problems	4
CAD 120	Introduction to SolidWorks	3
Total Credit Hours		17

CREO - Basic Vocational Specialist

Course	Title	Credit Hours
First Semester		
CAD 105	Introduction to Creo	3
CAD 111	Advanced Concepts in Creo	3
Total		6
Program Total		6

AutoCAD - Basic Vocational Specialist

Course	Title	Credits
CAD 108	Intro to Micro-CAD AutoCAD	3
CAD 118	Computer Graphics Advanced AutoCAD	3
Total Credit Hours		6

Solidworks - Basic Vocational Specialist

Course	Title	Credits
CAD 120	Introduction to SolidWorks	3
CAD 121	Advanced Concepts in SolidWorks	3
CAD 208	Applied Descriptive Geometry & Statics	4
Total Credit Hours		10

All CAD courses numbered 100 and above may be applied to the major field and elective requirement for the Associate in Arts and Associate in Science degrees.

All repeatable CAD courses can be counted only once toward graduation and in the GPA with the exception of CAD 220 Independent Research in CAD, which may be counted for a total of four hours.

CAD 101 Introduction to Engineering Design (4) 2,4

This course is an introduction to engineering and design. Topics included are: sketching, orthographic projection, descriptive geometry, dimensioning, section views, auxiliary views, primary and secondary views, threads, fasteners, and production drawings. All problems will be solved using CAD software. This course is repeatable 2 times. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Available.

In-District Tuition/Fees: \$620 (effective 2024/25 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: None

Semester(s) Offered: Fall and Spring

CAD 105 Introduction to Creo (3) 2,2

This course provides comprehensive instruction for users, or prospective users, of the Creo Parametric modeling application program. The class will provide the opportunity for students to familiarize themselves with the software and complete multiple modeling projects. The class consists of lectures and labs. This course is repeatable 1 time. (1.2) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$485 (effective 2024/25 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: None

Semester(s) Offered: Fall and Spring

CAD 108 Intro to Micro-CAD AutoCAD (3) 2,2

This course will provide the opportunity for students to familiarize themselves with the most popular micro-base computer aided drafting software available today-AutoCAD. The class consists of lectures and labs. The student will become familiar with window hardware configuration and basic system commands. This course is repeatable 1 time. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Available.

In-District Tuition/Fees: \$485 (effective 2024/25 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: None Recommended: Knowledge of drafting and microcomputers

Semester(s) Offered: Fall and Spring

CAD 110 Introduction to Inventor & 3D Printing (3) 3,2

This course Introduction to Autodesk Inventor and 3D Printing, provides comprehensive instruction for users, or prospective users, of the Autodesk Inventor parametric modeling application program. The class will provide the opportunity for students to familiarize themselves with the software and complete multiple modeling projects, which they will then learn to 3D print on Fused Deposition Modeler (FDM) 3D printers. The class consists of lectures and labs. (1.2) Proficiency Credit: Not Available Pass/No Credit: Not Available.

In-District Tuition/Fees: \$485 (effective 2024/25 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: None

Semester(s) Offered: Fall and Spring

CAD 111 Advanced Concepts in Creo (3) 2,2

Exploration of advanced solid modeling techniques for product design and manufacturing using Creo Parametric modeling software. Students will learn how to take computer sketches and transform them into three Dimensional Features. Parametric modeling techniques will be further explored to teach students how to create computer models of plastic molded parts, castings, and sheet metal. Students will also learn Photorealistic rendering of three dimensional models to visually communicate design ideas. Students must be prepared to put in at least two-four hours of extra lab time each week. This course is repeatable 1 time. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Not Available.

In-District Tuition/Fees: \$485 (effective 2024/25 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Grade of C or better in CAD 105 or consent of instructor.

Semester(s) Offered: Fall and Spring

CAD 118 Computer Graphics Advanced AutoCAD (3) 2,2

This course is designed for the advanced AutoCAD user. It will allow the student to dig deeper into the software and prepare them to work in a production environment. The course is divided into two halves. The first half of the course covers advanced 2D concepts such as external references, geometric calculator, layer filters, ctb files, custom viewports, publishing, DWF files, etc. The second half of the course will introduce the student to the world of 3-D using the solid modeling features of AutoCAD. Not only will the student learn to master the use of the multitude of modeling commands, they will also learn how to create photo realistic representations of their work. This course is repeatable 2 times. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Not Available.

In-District Tuition/Fees: \$485 (effective 2024/25 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: CAD 108 or consent of instructor

Semester(s) Offered: Fall and Spring

CAD 120 Introduction to SolidWorks (3) 2,2

This course provides comprehensive instruction for users, or prospective users of the SolidWorks parametric modeling application program. The class will provide the opportunity for students to familiarize themselves with the software and complete multiple modeling projects. The class consists of lectures and labs. (1.2) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$485 (effective 2024/25 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: None

Semester(s) Offered: Fall and Spring

CAD 121 Advanced Concepts in SolidWorks (3) 2,2

Exploration of advanced solid modeling techniques for product design and manufacturing using SolidWorks Parametric modeling software. Students will learn how to take computer sketches and transform them into 3 Dimensional Features. Parametric modeling techniques will be further explored to teach students how to create computer models of plastic molded parts, castings, and sheet metal. Students will also learn Photorealistic rendering and animation of 3 dimensional models to visually communicate design ideas. (1.2) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$485 (effective 2024/25 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Grade of C or better in CAD 120

Semester(s) Offered: Fall and Spring

CAD 205 Geometric Dimensioning & Tolerancing (3) 2,2

Geometric Dimensioning and Tolerancing (GD&T) is an international language that is used in engineering drawings to accurately describe a part to be manufactured. The GD&T language consists of a well-defined set of symbols, rules, definitions, and conventions. GD&T is a precise mathematical language that can be used to describe the size, form, orientation, and location of parts features. GD&T is also a design philosophy on how to design and dimension parts. In this class the student will be learning the basics of GD&T and how they apply to the world of manufacturing today. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Not Available.

In-District Tuition/Fees: \$485 (effective 2024/25 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: CAD 101 or EGR 101 or consent of instructor

Semester(s) Offered: Spring

CAD 206 Industrial Design Problems (4) 2,4

Study of actual and theoretical industrial drafting problems. Emphasis on use of specifications, standards and newest materials using current industrial drafting practice. Complete engineering with assembly, detail drawings and bill of materials is accomplished by the student. Combines lecture and laboratory. This course is repeatable 3 times. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Not Available.

In-District Tuition/Fees: \$620 (effective 2024/25 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Grade of C or better in EGR 101 or CAD 101 or consent of instructor

Semester(s) Offered: Spring

CAD 208 Applied Descriptive Geometry & Statics (4) 4,0

Applied descriptive geometry and statics course context allows the student to apply the skills learned in descriptive geometry for the solution of technical engineering problems. CAD 208 also consists of statics, dynamics, kinematics, kinetics, mechanisms, and hydraulics problems. Through the study of these disciplines, the student is taught how to design and lay out the products of industry and the structures of civil engineering. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Not Available.

In-District Tuition/Fees: \$620 (effective 2024/25 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Grade of C or better in EGR 101 or CAD 101 or consent of instructor

Semester(s) Offered: Spring and Summer

CAD 220 Independent Research in CAD (1-4) 2,0

(1-4, 2-0) Designed to increase the learning opportunities for those students desiring to expand their knowledge and skills beyond that which are presently offered in regular CAD classes. Areas of study, under the supervision of an instructor, would include such areas as plastic mold design, FEM, advanced auto-route, auto-place, advanced surfacing and shading techniques, piping, CAE, behavioral modeling, ISDX, and P.C. manufacturing. This course is repeatable 3 times. (1.2) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$620 (effective 2024/25 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Demonstrated ability to excel in an area of interest and consent of instructor

Semester(s) Offered: Fall and Spring