

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

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	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 Report Writing	3
Required Math/Science Course (http://catalog.elgin.edu/degree-programs-certificates/career-technical/associate-applied-science-degrees-general-education-requirements)		3
IMT 112	Metrology-The Study of Measurement	3
Total		16
Third Semester		
Social/Behavioral Science Requirement (http://catalog.elgin.edu/degree-programs-certificates/career-technical/associate-applied-science-degrees-general-education-requirements)		3
CAD 108	Intro to Micro-CAD AutoCAD	3
CAD 118	Computer Graphics Advanced AutoCAD	3
CAD 105	Pro/ENGINEER Basic Design Training	3
Required Liberal Education Course (http://catalog.elgin.edu/degree-programs-certificates/career-technical/associate-applied-science-degrees-general-education-requirements)		3
Total		15
Fourth Semester		
CAD 111	Pro/E Adv Part & Assembly Design	3
CAD 208	Applied Descriptive Geometry & Statics	4
CAD 205	Geometric Dimensioning & Tolerancing	3
IMT 110	Intro to Computer Integrated Mfg	2
WEL 101 or WEL 120	Welding I or Blueprint Reading for Welders	2
Total		14
Program Total		61

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	Pro/ENGINEER Basic Design Training	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

Practicing Professional-ProE - Basic Vocational Specialist

Course	Title	Credit Hours
First Semester		
CAD 105	Pro/ENGINEER Basic Design Training	3
CAD 111	Pro/E Adv Part & Assembly Design	3
Total		6
Second Semester		
CAD 211	Pro/E Pro/SURFACE	3
CAD 215	Pro/E Super User Training	3
Total		6
Third Semester		
CAD 115	Pro/E Production Drawing & Detailing	3
Total		3
Program Total		15

AutoCAD - Basic Vocational Specialist

Course	Title	Credits
CAD 108	Intro to Micro-CAD AutoCAD ¹	3
CAD 118	Computer Graphics Advanced AutoCAD ¹	3
Total Credit Hours		6

¹ May be taken the same semester. First eight weeks: CAD 108 Intro to Micro-CAD AutoCAD; second eight weeks: CAD 118 Computer Graphics Advanced AutoCAD.

Architectural Design - Basic Vocational Specialist

Course	Title	Credits
CAD 108	Intro to Micro-CAD AutoCAD	3
CAD 109	Foundations of Architectural Design	3
CAD 119	Advanced Architectural Design	3
Total Credit Hours		9

Revit[®] - Basic Vocational Specialist

Course	Title	Credits
CAD 130	Introduction to Revit	3
CAD 131	Advanced Concepts in Revit	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. Repeatable to 12 credit hours (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Available. **In-District Tuition/Fees:** \$608 (effective 2019/20 academic year) In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

Prerequisite: None

Semester(s) Offered: Fall and Spring

CAD 105 Pro/ENGINEER Basic Design Training (3) 2,2

This course covers the basic functions needed to use Pro/ENGINEER to create parts, drawings, and assemblies. Emphasis is on the Pro/ENGINEER design philosophy used in creating parts and assemblies. Hands-on time with Pro/ENGINEER is maximized in this course. Labs are taught on the latest technology Windows 2000 work stations. Both part and assembly design, along with basic drawing creation, are presented. Students construct "real world" parts and assemblies using "Top-Down" Design, with the instructor acting as an expert consultant. Students must be prepared to put in at least two-four hours of extra lab time each week. (1.2) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$476 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

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. Course is repeatable to six credits. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Available.

In-District Tuition/Fees: \$476 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

Prerequisite: None Recommended: Knowledge of drafting and microcomputers

Semester(s) Offered: Fall and Spring

CAD 109 Foundations of Architectural Design (3) 2,2

This course covers the introductory concepts of residential and light commercial architectural design. (1.2) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$476 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

Prerequisite: Grade of C or better in CAD 108 or consent of instructor
Semester(s) Offered: Varies

CAD 111 Pro/E Adv Part & Assembly Design (3) 2,2

This course, covering advanced topics and techniques used during part and assembly design, is structured for the experienced Pro/ENGINEER user to become more productive. Functionality in the Pro/FEATURE module is also covered. Labs are taught on the latest technology Windows 2000 work stations. Students must be prepared to put in at least two-four hours of extra lab time each week. Repeatable to six credits. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Not Available.

In-District Tuition/Fees: \$476 (effective 2019/20 academic year)

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Prerequisite: CAD 105 or consent of instructor

Semester(s) Offered: Fall and Spring

CAD 115 Pro/E Production Drawing & Detailing (3) 2,2

This course covers detailing and drafting capabilities utilized within Pro/ENGINEER to produce complete detailed drawings. Detailing and drafting functionality of Pro/ENGINEER and Pro/DETAIL is explained. Students use Pro/ENGINEER's markup capabilities to check a drawing and Pro/REPORT to help document drawings. Labs are taught on the latest technology Windows 2000 work stations. Students must be prepared to put in at least two-four hours of extra lab time each week. Course is repeatable to nine credits. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Not Available.

In-District Tuition/Fees: \$476 (effective 2019/20 academic year)

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Prerequisite: CAD 105 or consent of instructor

Semester(s) Offered: Varies

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. Repeatable to nine credits; only three credits may apply toward a degree or certificate. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Not Available.

In-District Tuition/Fees: \$476 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

Prerequisite: CAD 108 or consent of instructor

Semester(s) Offered: Fall and Spring

CAD 119 Advanced Architectural Design (3) 2,2

This course will provide comprehensive instruction for preparing architectural working drawings using traditional and computer-based methods. Design and construction principles and methods will be fully presented. The class will be focused around the design-building process, so as to make the topics easy to understand and appealing to students. Advanced topics and concepts are covered in this advanced class including green design, alternative energy uses/sources, alternative materials & techniques, client presentation methods, and employment search tactics. (1.2) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$476 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

Prerequisite: Grade of C or better in CAD 108 and CAD 109

Semester(s) Offered: Varies

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: \$476 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

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: \$476 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

Prerequisite: Grade of C or better in CAD 120

Semester(s) Offered: Fall and Spring

CAD 130 Introduction to Revit (3) 2,2

This course provides comprehensive instruction for users, or prospective users, of the Revit 3-dimensional architectural modeling application program. The class will provide the opportunity for students to familiarize themselves with the software and complete multiple architectural modeling projects. The class consists of lectures and labs. (1.2) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$476 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

Prerequisite: PNone

Semester(s) Offered: Varies

CAD 131 Advanced Concepts in Revit (3) 2,2

Advanced Concepts in Revit explores solid modeling techniques for design and modeling using Revit 3-dimensional modeling software. Students will learn how to take customer specifications and transform them into 3 dimensional architectural models. Advanced Revit features and modeling techniques will be further explored to teach students how to create computer models of specific architectural details as well as finished products for release. Students will learn photo-realistic rendering and animation of the Revit generated architectural models so as to visually communicate design ideas to clients and employees. (1.2) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$476 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

Prerequisite: Grade of C or better in CAD 130

Semester(s) Offered: Varies

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: \$476 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

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. Repeatable to 12 credit hours. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Not Available.

In-District Tuition/Fees: \$608 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

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: \$608 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

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

Semester(s) Offered: Spring and Summer

CAD 211 Pro/E Pro/SURFACE (3) 2,2

This course covers advanced feature creation utilizing the Pro/SURFACE module. Surface feature and supporting geometry creation, manipulation, and technique are discussed. Functions for inspecting surface quality and verifying consistency between neighboring surfaces are also covered. Students generate various types of parametric surfaces and features used to create solid models. A variety of models are created to familiarize students with the course topics. Extensive work is done with double-curved surfaces and rounds. Labs are taught on the latest technology Windows 2000 work stations. Students must be prepared to put in at least two-four hours of extra lab time each week. Course is repeatable to six credits. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Not Available.

In-District Tuition/Fees: \$476 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

Prerequisite: CAD 206 or CAD 207 or CAD 208 and CAD 111 or consent of instructor

Semester(s) Offered: Varies

CAD 215 Pro/E Super User Training (3) 2,2

This course is intended for the advanced Pro/ENGINEER user who has fulfilled the prerequisite and is interested in expanding his/her Pro/ENGINEER knowledge. Students work with advanced modeling, assembly, and drawing techniques - topics that have been specifically identified by experts for inclusion in this class. Specially designed exercises show how to understand and implement these advanced techniques. Part One of the course deals with the PTC Pro/Sheet Metal module, as well as rips, bends, bend tables, sheet metal drawings, and unfolding flat patterns, etc. Part Two of the course deals with the PTC Mechanisms Design module which encompasses the motion and kinematics aspects of putting a parametric solid model assembly into motion within a 3-D world. Part Two may be replaced by another appropriate module providing appropriate PTC training materials are available and that the Part Two unit is approved by the supervising instructor. Students will also learn advanced methods of data interface, data management, and configuration customization. Students must be prepared to put in at least two-four hours of extra lab time each week. Course is repeatable to nine credits. (1.2) Proficiency Credit Available (2 LETSIR) Pass/No Credit Not Available.

In-District Tuition/Fees: \$476 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

Prerequisite: CAD 211 or consent of instructor

Semester(s) Offered: Varies

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. Course is repeatable three (3) times up to eight credits. (1.2) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$608 (effective 2019/20 academic year)

In-district tuition is subject to change based on Board approval (<https://elgin.edu/pay-for-college/tuition-fees/>).

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

Semester(s) Offered: Fall and Spring