Secondary Education (Pre-Professional): Certificate of Achievement

SAC.CDSE.CA

Program Control Number: 40528

The Secondary Education (Pre-Professional) Certificate is intended to provide students with skills necessary to work with secondary education students (middle and high school) in an after-school setting, provide tutoring or homework assistance, or assist in academic enrichment programs. This certificate is also pre-professional preparation for students preparing to transfer to a university to earn a bachelor's degree and single subject teaching credential.

Learning Outcome(s):

1. Students who complete the certificate in secondary education will be able to:Apply skills necessary to work with secondary education students (middle and high school) in an after-school setting

Required Courses		**Units: 14.0-16.0**
EDUC 105	Exploration in the Field of Education	3.0
	–or–	
CNSL 114	Careers in Teaching (same as CDEV 114)	1.0
	–or–	
CDEV 114	Careers in Teaching (same as CNSL 114)	1.0
EDUC 210	The Teaching Experience: Secondary Education	3.0
EDUC 204	Proficiency in Educational Technologies for Teachers	3.0
CDEV 205	Introduction to Children with Special Needs (same as EDUC 203)	3.0
ENGL C1000	Academic Reading and Writing	4.0
Plus one content course (choose one)		**Units: 3.0-5.0**
BIOL 211	Cellular and Molecular Biology	5.0
MATH 140	College Algebra	4.0
CHEM 209	Introductory Chemistry	4.0
ENGL 231	Survey of English Literature I	3.0
GEOL 101	Dynamic Earth: Introduction to Geology	3.0
HIST 120	The United States to 1877	3.0
SPAN 201	Intermediate Spanish I	5.0
	–or–	
	Or completion of 9 units of CTE Coursework in a subject area taught in a secondary setting	
		Total: 17.0-21.0

ENGINEERING

Engineering: A.S. Degree

Program Code: SAC.ENGR.AS

Program Control Number: 04201

This program provides a basic program of engineering coursework for students planning to transfer to a university engineering program. Students are also advised to communicate with their desired university to determine the specific required coursework to transfer with upperdivision status at their school of choice.

Transfer students are also advised to take job skills courses to improve their employability. Examples include: ENGR 133, 114, 158 (for mechanical majors); 184, 118 (for civil majors); and 131, 133 (for electrical majors).

Students should select courses from the "engineering or engineering-related courses" block based on major:

Mechanical and aerospace engineering majors: ENGR 235, 240, 250, 250L, 280, 125, 103

Civil and environmental engineering majors: ENGR 235, 240, 280, 125, 183; Electrical and computer engineering majors: ENGR 250, 250L, 183; CMPR 120, 121

Learning Outcome(s):

1. apply math and science concepts and techniques to engineering problems
2. solve engineering problems of common lower division engineering courses

The associate degree also requires completion of general education coursework per the college catalog

Engineering and engineering-related courses (take at least 9 units):		**Units: 9.0-11.0**
ENGR 100A	Introduction to Engineering	3.0
ENGR 125	Engineering Graphics	3.0
ENGR 103	Solidworks Beginning Solid Modeling (same as MNFG 103)	3.0
ENGR 183	AutoCAD I	4.0
ENGR 235	Statics	3.0
ENGR 240	Dynamics	3.0
ENGR 250	Electric Circuits	3.0
ENGR 250L	Electric Circuits Laboratory	1.0
ENGR 280	Strength of Materials	3.0
CMPR 120	Introduction to Programming	3.0
CMPR 121	Programming Concepts	3.0
Science and math courses:		**Units: 21.0**
MATH 180	Single Variable Calculus I	4.0
MATH 185	Single Variable Calculus II	4.0
PHYS 217	Engineering Physics I	4.0
PHYS 227	Engineering Physics II	4.0
	–or–	
PHYS 237	Engineering Physics III	4.0
CHEM 219	General Chemistry	5.0
	–or–	
CHEM 219H	Honors General Chemistry	5.0
		Total: 30.0-32.0

Engineering CAD Drafting: A.S. Degree

Program Code: SAC.ENRCA.AS

Program Control Number: 08720

This program prepares students for employment as a MECHANICAL or CIVIL ENGINEERING COMPUTER-AIDED DESIGN (CAD) DRAFTER, and has a strong focus on teaching industry-standard CAD software in the respective areas. Students select one of two options:

(1) MECHANICAL, which focuses on 3D solid modeling CAD, or

(2) CIVIL, which focuses on AutoCAD, Civil 3D, and REVIT.

If more units are needed to complete the associates degree, it is suggested students also select from the following list: For mechanical drafting (ENGR 114), for civil drafting (ENGR 118, 119).

Learning Outcome(s):

1. use CAD software to produce industry-standard models
2. use CAD software to produce industry-standard technical drawings

The associate degree also requires completion of general education coursework per the college catalog

Required core courses:		**Units: 9.0-10.0**
ENGR 100A	Introduction to Engineering	3.0
	–or–	
ENGR 100B	Introduction to Civil Engineering	2.0
ENGR 122	Engineering Drawing	3.0
	–or–	
ENGR 125	Engineering Graphics	3.0
ENGR 183	AutoCAD I	4.0
Select the Mechanical or Civil Option		
Mechanical Option:		
ENGR 103	Solidworks Beginning Solid Modeling (same as MNFG 103)	3.0
	–or–	
MNFG 103	Solidworks Beginning Solid Modeling (same as ENGR 103)	3.0
ENGR 104	Solidworks Intermediate Solid Modeling (same as MNFG 104)	3.0
	–or–	
MNFG 104	Solidworks Intermediate Solid Modeling (same as ENGR 104)	3.0
ENGR 105	Solidworks Advanced Solid Modeling (same as MNFG 105)	3.0
	–or–	
MNFG 105	Solidworks Advanced Solid Modeling (same as ENGR 105)	3.0
MNFG 106	Solidworks Drawings	3.0
Civil Option:		
ENGR 012	Civil/Architectural Blueprint Reading	2.0
ENGR 184	AutoCAD II	4.0
ENGR 185	Civil 3D	4.0
ENGR 154	Revit and Civil Drafting	4.0
		Total: 21.0-24.0

Engineering Civil Drafting and Design: A.S. Degree

Program Code: SAC.ENRCE.AS

Program Control Number: 04212

This program prepares students for employment as a DRAFTER or DESIGNER in the CIVIL ENGINEERING, architecture, or construction fields. Civil drafters create detailed technical drawings of buildings, structures, and various construction projects designed by architects and civil engineers. Civil drafters must be proficient in industry-standard CAD software (AutoCAD, Civil 3D, REVIT) and have knowledge of industrystandard drafting practices. Employment is available in private industry and at local and county government agencies.

This program also develops essential job skills for ENGINEERS. Many university engineering programs may not include these job skill courses as part of their curriculum. Other courses in this program may transfer to the university.

If more units are needed to complete the associate degree, it is suggested students also take: ENGR 118, 119 (surveying).

Learning Outcome(s):

1. select and develop engineering careers
2. read and produce industry-standard civil engineering drawings.
3. use a variety of CAD software standard for the civil engineering field

The associate degree also requires completion of general education coursework per the college catalog

Required core courses:		**Units: 23.0-24.0**
ENGR 100A	Introduction to Engineering	3.0
	–or–	
ENGR 100B	Introduction to Civil Engineering	2.0
ENGR 012	Civil/Architectural Blueprint Reading	2.0
ENGR 122	Engineering Drawing	3.0
	–or–	
ENGR 125	Engineering Graphics	3.0
ENGR 183	AutoCAD I	4.0
ENGR 184	AutoCAD II	4.0
ENGR 185	Civil 3D	4.0
ENGR 154	Revit and Civil Drafting	4.0
		Total: 23.0-24.0

Engineering Civil Technology: A.S. Degree

Program Code: SAC.ENRCT.AS

Program Control Number: 04202

This program prepares students for employment as a CIVIL ENGINEERING TECHNICIAN. Civil engineering technicians assist civil engineers and surveyors to plan, design, and build various infrastructure projects (e.g., highways, bridges, utilities, etc.) as well as commercial, industrial, and residential projects.

This program also develops essential job skills for ENGINEERS. Many university engineering programs may not include these job skill courses as part of their curriculum. Other courses in this program may transfer to the university.

Learning Outcome(s):

1. select and develop engineering careers
2. use CAD software to produce industry-standard models and technical drawings.
3. use common land surveying instruments

The associate degree also requires completion of general education coursework per the college catalog

Required core courses:		**Units: 31.0-32.0**
ENGR 100A	Introduction to Engineering	3.0
	–or–	
ENGR 100B	Introduction to Civil Engineering	2.0
ENGR 122	Engineering Drawing	3.0
	–or–	
ENGR 125	Engineering Graphics	3.0
ENGR 183	AutoCAD I	4.0
ENGR 184	AutoCAD II	4.0
ENGR 185	Civil 3D	4.0
ENGR 118	Surveying	3.0
ENGR 119	Advanced Plane Surveying	3.0
GEOL 101	Dynamic Earth: Introduction to Geology	3.0
GEOL 101L	Dynamic Earth: Introduction to Geology Laboratory	1.0
MATH 162	Trigonometry	4.0
		Total: 31.0-32.0

Engineering Mechanical Drafting and Design: A.S. Degree

Program Code: SAC.ENRDD.AS

Program Control Number: 04203

This program prepares students for employment as a MECHANICAL ENGINEERING DRAFTER or DESIGNER. Mechanical drafters use MCAD (mechanical computer-aided drafting/design) software to create solid models and then detailed technical drawings of machinery or mechanical devices produced by engineers. Mechanical drafters must be proficient in parametric MCAD software and have knowledge of current industry drafting practices. Designers are typically drafters with additional industry experience and training. Designers take generic designs from engineers and add detail to them (e.g., material and fastener selection) using MCAD. Employment is primarily in the private industries such as aerospace, biomedical, industrial, and other manufacturing industries.

This program also develops essential job skills for ENGINEERS. Many university engineering programs may not include these job skill courses as part of their curriculum. Other courses in this program may transfer to the university.

If more units are needed to complete the associate degree, it is suggested students also select courses from the following list: ENGR 184, 131, 133, or trigonometry.

Learning Outcome(s):

1. apply the rules of orthographic projection to create multi-view drawings
2. produce industry-standard models and engineering drawings.
3. effectively use CAD software to produce models and drawings

The associate degree also requires completion of general education coursework per the college catalog

Required core courses:		**Units: 28.0**
ENGR 100A	Introduction to Engineering	3.0
ENGR 122	Engineering Drawing	3.0
	–or–	
ENGR 125	Engineering Graphics	3.0
ENGR 183	AutoCAD I	4.0
ENGR 103	Solidworks Beginning Solid Modeling (same as MNFG 103)	3.0
	–or–	
MNFG 103	Solidworks Beginning Solid Modeling (same as ENGR 103)	3.0
ENGR 104	Solidworks Intermediate Solid Modeling (same as MNFG 104)	3.0
	–or–	
MNFG 104	Solidworks Intermediate Solid Modeling (same as ENGR 104)	3.0
ENGR 105	Solidworks Advanced Solid Modeling (same as MNFG 105)	3.0
	–or–	
MNFG 105	Solidworks Advanced Solid Modeling (same as ENGR 105)	3.0
MNFG 106	Solidworks Drawings	3.0
ENGR 114	Geometric Dimensioning and Tolerancing (same as MNFG 114)	3.0
	–or–	
MNFG 114	Geometric Dimensioning and Tolerancing (same as ENGR 114)	3.0
ENGR 158	Basic Machining Concepts and Operations (same as MNFG 158)	3.0
	–or–	
MNFG 158	Basic Machining Concepts and Operations (same as ENGR 158)	3.0
		Total: 28.0

Engineering Mechatronics: A.S. Degree

Program Code: SAC.ENMT.AS

Program Control Number: 08711

This program prepares students for employment as a MECHANICAL ENGINEERING TECHNICIAN or as an engineering technician in the related areas of electro-mechanical, aerospace, biomedical, industrial, or manufacturing. The program focuses on mechatronics – mechanical systems controlled with electronics or computer technology. The program emphasizes hands-on learning and covers: robotics, automation, PLC (programmable logic control), rapid prototyping, micro-controllers like Arduino, sensors, actuators, control systems, testing, measurement, programming, and basic circuits.

Employment is mainly in private manufacturing industries such as the mechanical, aerospace, biomedical, or industrial areas.

This program also develops essential job skills for ENGINEERS. Many university engineering programs may not include these job skill courses as part of their curriculum. Other courses in this program may transfer to the university.

If more units are needed to complete the associate degree (~ 60 units), it is suggested students also select from the following list: Cmpr 120 (C programming), CMPR 121 (C programming), ENGR 250L (circuits lab), ENGR 131, 104, and WELD 101.

Learning Outcome(s):

1. design, fabricate, program, and operate mechatronics systems
2. program and operate micro-controllers to obtain sensor data and to control various actuators
3. use various rapid prototyping and/or automation equipment

The associate degree also requires completion of general education coursework per the college catalog

Required core courses:		**Units: 20.0**
ENGR 100A	Introduction to Engineering	3.0
ENGR 122	Engineering Drawing	3.0
	–or–	
ENGR 125	Engineering Graphics	3.0
ENGR 103	Solidworks Beginning Solid Modeling (same as MNFG 103)	3.0
	–or–	
MNFG 103	Solidworks Beginning Solid Modeling (same as ENGR 103	3.0
ENGR 132	Introduction to Robotics	2.0
ENGR 133	Mechatronics I	3.0
ENGR 134	Mechatronics II	3.0
ENGR 158	Basic Machining Concepts and Operations (same as MNFG 158)	3.0
	–or–	
MNFG 158	Basic Machining Concepts and Operations (same as ENGR 158)	3.0
		Total: 20.0

Engineering CAD Drafting: Certificate of Achievement

Program Code: SAC.enrca.ca

Program Control Number: 21773

This program prepares students for employment as a MECHANICAL or CIVIL ENGINEERING COMPUTER-AIDED DESIGN (CAD) DRAFTER, and has a strong focus on teaching industry-standard CAD software in the respective areas. Students select one of two options:

(1) MECHANICAL, which focuses on 3D solid modeling CAD or

(2) CIVIL, which focuses on AutoCAD, Civil 3D, and REVIT.

This program also develops essential job skills for ENGINEERS. Many university engineering programs may not include these job skill courses as part of their curriculum. Other courses in this program may transfer to the university.

Learning Outcome(s):

1. Use CAD software to produce industry-standard models
2. Use CAD software to produce industry-standard technical drawings

Required core courses:		**Units: 9.0-10.0**
ENGR 100A	Introduction to Engineering	3.0
	–or–	
ENGR 100B	Introduction to Civil Engineering	2.0
ENGR 122	Engineering Drawing	3.0
	–or–	3.0
ENGR 125	Engineering Graphics	3.0
ENGR 183	AutoCAD I	4.0

Select the Mechanical Option or the Civil Option		**Units: 12.0-14.0**
Mechanical Option:		
ENGR 103	Solidworks Beginning Solid Modeling (same as MNFG 103)	3.0
	–or–	
MNFG 103	Solidworks Beginning Solid Modeling (same as ENGR 103	3.0
ENGR 104	Solidworks Intermediate Solid Modeling (same as MNFG 104)	3.0
	–or–	
MNFG 104	Solidworks Intermediate Solid Modeling (same as ENGR 104)	3.0
ENGR 105	Solidworks Advanced Solid Modeling (same as MNFG 105)	3.0
	–or–	
MNFG 105	Solidworks Advanced Solid Modeling (same as ENGR 105)	3.0
MNFG 106	Solidworks Drawings	3.0
Civil Option:		
ENGR 012	Civil/Architectural Blueprint Reading	2.0
ENGR 184	AutoCAD II	4.0
ENGR 185	Civil 3D	4.0
ENGR 154	Revit and Civil Drafting	4.0
		Total: 21.0-24.0

Engineering Civil Drafting and Design: Certificate of Achievement

Program Code: SAC.ENRCE.CA

Program Control Number: 21775

This program prepares students for employment as a DRAFTER or DESIGNER in the CIVIL ENGINEERING, architecture, or construction fields. Civil drafters create detailed technical drawings of buildings, structures, and various construction projects designed by architects and civil engineers.

Civil drafters must be proficient in industry standard CAD software (AutoCAD, Civil 3D, REVIT) and have knowledge of industry-standard drafting practices. Employment is available in private industry and at local and county government agencies.

This program also develops essential job skills for ENGINEERS. Many university engineering programs may not include these job skill courses as part of their curriculum. Other courses in this program may transfer to the university.

Learning Outcome(s):

1. select and develop engineering careers
2. read and produce industry-standard civil engineering drawings
3. use a variety of CAD software standard for the civil engineering field

Required core courses:		**Units: 23.0-24.0**
ENGR 100A	Introduction to Engineering	3.0
	–or–	
ENGR 100B	Introduction to Civil Engineering	2.0
ENGR 012	Civil/Architectural Blueprint Reading	2.0
ENGR 122	Engineering Drawing	3.0
	–or–	
ENGR 125	Engineering Graphics	3.0
ENGR 183	AutoCAD I	4.0
ENGR 184	AutoCAD II	4.0
ENGR 185	Civil 3D	4.0
ENGR 154	Revit and Civil Drafting	4.0
		Total: 23.0-24.0

Engineering Civil Technology: Certificate of Achievement

Program Code: SAC.ENRCT.CA

Program Control Number: 21766

This program prepares students for employment as a CIVIL ENGINEERING TECHNICIAN. Civil engineering technicians assist civil engineers and surveyors to plan, design, and build various infrastructure projects (e.g., highways, bridges, utilities, etc.) as well as commercial, industrial, and residential projects.

This program also develops essential job skills for ENGINEERS. Many university engineering programs may not include these job skill courses as part of their curriculum. Other courses in this program may transfer to the university.

Learning Outcome(s):

1. select and develop engineering careers
2. use CAD software to produce industry-standard models and technical drawings.
3. use common land surveying instruments

Required core courses:		**Units: 31.0-32.0**
ENGR 100A	Introduction to Engineering	3.0
	–or–	
ENGR 100B	Introduction to Civil Engineering	2.0
ENGR 122	Engineering Drawing	3.0
	–or–	
ENGR 125	Engineering Graphics	3.0
ENGR 183	AutoCAD I	4.0
ENGR 184	AutoCAD II	4.0
ENGR 185	Civil 3D	4.0
ENGR 118	Surveying	3.0
ENGR 119	Advanced Plane Surveying	3.0
GEOL 101	Dynamic Earth: Introduction to Geology	3.0
GEOL 101L	Dynamic Earth: Introduction to Geology Laboratory	1.0
MATH 162	Trigonometry	4.0
		Total: 31.0-32.0

Engineering Mechanical Drafting and Design: Certificate of Achievement

Program Code: SAC.enrdd.ca

Program Control Number: 21774

This program prepares students for employment as a MECHANICAL ENGINEERING DRAFTER or DESIGNER. Mechanical drafters use MCAD (mechanical computer-aided drafting/design) software to create solid models and then detailed technical drawings of machinery or mechanical devices produced by engineers. Mechanical drafters must be proficient in parametric MCAD software and have knowledge of current industry drafting practices. Designers are typically drafters with additional industry experience and training. Designers take generic designs from engineers and add detail to them (e.g., material and fastener selection) using MCAD. Employment is primarily in the private industries such as aerospace, biomedical, industrial, and other manufacturing industries.

This program also develops essential job skills for ENGINEERS. Many university engineering programs may not include these job skill courses as part of their curriculum. Other courses in this program may transfer to the university.

Learning Outcome(s):

1. apply the rules of orthographic projection to create multi-view drawings
2. produce industry-standard models and engineering drawings.
3. effectively use CAD software to produce models and drawings

Required Core Courses:		**Units: 28.0**
ENGR 100A	Introduction to Engineering	3.0
ENGR 122	Engineering Drawing	3.0
	–or–	
ENGR 125	Engineering Graphics	3.0
ENGR 183	AutoCAD I	4.0
ENGR 103	Solidworks Beginning Solid Modeling (same as MNFG 103)	3.0
	–or–	
MNFG 103	Solidworks Beginning Solid Modeling (same as ENGR 103)	3.0
ENGR 104	Solidworks Intermediate Solid Modeling (same as MNFG 104)	3.0
	–or–	
MNFG 104	Solidworks Intermediate Solid Modeling (same as ENGR 104)	3.0
ENGR 105	Solidworks Advanced Solid Modeling (same as MNFG 105)	3.0
	–or–	
MNFG 105	Solidworks Advanced Solid Modeling (same as ENGR 105)	3.0
MNFG 106	Solidworks Drawings	3.0
ENGR 114	Geometric Dimensioning and Tolerancing (same as MNFG 114)	3.0
	–or–	
MNFG 114	Geometric Dimensioning and Tolerancing (same as ENGR 114)	3.0
ENGR 158	Basic Machining Concepts and Operations (same as MNFG 158)	3.0
	–or–	
MNFG 158	Basic Machining Concepts and Operations (same as ENGR 158)	3.0
		Total: 28.0

Engineering Mechatronics: Certificate of Achievement

Program Code: SAC.ENMT.CA

Program Control Number: 21776

This program prepares students for employment as a MECHANICAL ENGINEERING TECHNICIAN or as an engineering technician in the related areas of electro-mechanical, aerospace, biomedical, industrial, or manufacturing. The program focuses on mechatronics – mechanical systems controlled with electronics or computer technology. The program emphasizes hands-on learning and covers: robotics, automation, PLC (programmable logic control), rapid prototyping, micro-controllers like Arduino, sensors, actuators, control systems, testing, measurement, programming, and basic circuits.

Employment is mainly in private manufacturing industries such as the mechanical, aerospace, biomedical, or industrial areas.

This program also develops essential job skills for ENGINEERS. Many university engineering programs may not include these job skill courses as part of their curriculum. Other courses in this program may transfer to the university.

Learning Outcome(s):

1. design, fabricate, program, and operate mechatronics systems
2. program and operate micro-controllers obtain sensor data and to control various actuators
3. use various rapid prototyping and/or automation equipment

Required core courses:		**Units: 20.0**
ENGR 100A	Introduction to Engineering	3.0
ENGR 122	Engineering Drawing	3.0
	–or–	
ENGR 125	Engineering Graphics	3.0
ENGR 103	Solidworks Beginning Solid Modeling (same as MNFG 103)	3.0
	–or–	
MNFG 103	Solidworks Beginning Solid Modeling (same as ENGR 103)	3.0
ENGR 132	Introduction to Robotics	2.0
ENGR 133	Mechatronics I	3.0
ENGR 134	Mechatronics II	3.0
ENGR 158	Basic Machining Concepts and Operations (same as MNFG 158)	3.0
	–or–	
MNFG 158	Basic Machining Concepts and Operations (same as ENGR 158)	3.0
		Total: 20.0

Engineering STEM Core: Certificate of Achievement

Program Code: SAC.ENRSC.CA

Program Control Number: 41540

This program provides a basic program of engineering coursework for students planning to transfer to a university engineering program. For the elective block, students should select based on major:

Mechanical and aerospace engineering majors: ENGR 235, 240, 103

Civil and environmental engineering majors: ENGR 235, 240, 183

Electrical and computer engineering majors: ENGR 250, CMPR 120, CMPR 121

Learning Outcome(s):

1. apply math and science concepts and techniques to engineering problems
2. solve problems of common lower division engineering courses

Science and math courses		**Units: 15.0-16.0**
MATH 180	Single Variable Calculus I	4.0
MATH 185	Single Variable Calculus II	4.0
PHYS 217	Engineering Physics I	4.0
CHEM 209	Introductory Chemistry	4.0
	–or–	
CMPR 120	Introduction to Programming	3.0
Elective courses (engineering and related) (select 1)		**Units: 3.0-5.0**
ENGR 235	Statics	3.0
ENGR 240	Dynamics	3.0
ENGR 250	Electric Circuits	3.0
ENGR 183	AutoCAD I	4.0
ENGR 103	Solidworks Beginning Solid Modeling (same as MNFG 103)	3.0
CHEM 219	General Chemistry	5.0
CMPR 121	Programming Concepts	3.0
		Total: 18.0-21.0

Engineering AutoCAD 2D Basics: Certificate of Proficiency

Program Code: SAC.CAD2D.CERT

This program prepares students for entry level DRAFTER positions that require knowledge of AutoCAD, typically in the architectural, civil, construction, and industrial fields. Students will learn to create and edit technical drawings and annotate designs. The program may be completed in less than one year, and it provides a good first step to more advanced drafting technology coursework and programs.

Learning Outcome(s):

1. Effectively use AutoCAD software

Required core courses:		**Units: 10.0-11.0**
ENGR 100A	Introduction to Engineering	3.0
	–or–	
ENGR 100B	Introduction to Civil Engineering	2.0
ENGR 183	AutoCAD I	4.0
ENGR 184	AutoCAD II	4.0
		Total: 10.0-11.0

Engineering Mechanical 3D Solid Modeling CAD: Certificate of Proficiency

Program Code: SAC.ENGR3D.CERT

This program prepares students for employment as a MECHANICAL ENGINEERING DRAFTER or DESIGNER. Mechanical drafters use MCAD (mechanical computer-aided drafting/design) software to create solid models and then detailed technical drawings of machinery or mechanical devices designed by engineers. The program focuses on training students on industry-standard MCAD software that is used heavily in the mechanical, aerospace, automotive, industrial, & biomedical engineering fields. Students learn to use the parametric nature of MCAD software to produce changeable models incorporating “design intent” and to produce drawings that conform to industry standards. The skills learned are applicable to drafters, designers, engineering technicians, and engineers in these fields.

Employment is primarily in the private manufacturing industries such as aerospace, biomedical, industrial, and many other manufacturing industries.

This program also develops essential job skills for ENGINEERS. Many university engineering programs may not include these job skill courses as part of their curriculum. Other courses in this program may transfer to the university.

Learning Outcome(s):

1. apply rules of orthographic projection to create multi-view drawings
2. produce industry-standard models and technical drawings
3. effectively use 3D solid modeling CAD software

Required Core Courses:		**Units: 15.0**
ENGR 103	Solidworks Beginning Solid Modeling (same as MNFG 103)	3.0
ENGR 104	Solidworks Intermediate Solid Modeling (same as MNFG 104)	3.0
ENGR 105	Solidworks Advanced Solid Modeling (same as MNFG 105)	3.0
MNFG 106	Solidworks Drawings	3.0
ENGR 122	Engineering Drawing	3.0
	–or–	
ENGR 125	Engineering Graphics	3.0
		Total: 15.0

ENGLISH

English: A.A.-T Degree for Transfer

Program Code: SAC.engl.aat

Program Control Number: 32436

The Associate in Arts in English for Transfer (A.A.-T in English) prepares students to move into the CSU system leading to a baccalaureate degree in English. Please consult a counselor regarding specific course requirements for your transfer institution. Completion of the A.A.-T degree in English also provides guaranteed admission with junior status to the CSU system, although does not guarantee admission to a specific campus or major. Upon completion of the A.A.-T in English, students will have demonstrated an general understanding of the academic standards expected of readers and writers of the English language. They will be able to apply critical thinking skills in order to evaluate literary works for their artistic and literary merits as well as analyze them according to various interpretive theories and for the use of literary devices. Students will be able to produce correctly formatted, documented, and cited academic essays that utilize appropriately chosen sources in support of their arguments.

Requirements for all Associate Degrees for Transfer:

1. Completion of 60 semester CSU transferable units.
2. Completion of the California General Education Transfer Curriculum (Cal-GETC). The CSU GE (California State University General Education Breadth) or IGETC (Intersegmental General Education Transfer Curriculum) pattern may be used in some cases; please see a counselor for details.
3. Obtainment of a minimum grade point average of at least a 2.0 in all CSU transferable coursework.
4. Minimum grade of “C” (or “P”) for each course in the major. If the course was taken on a Pass/No Pass basis the “P” must be equal to a “C” or better.
5. Completion of a minimum of 18 semester units in the major or area of emphasis.

Learning Outcome(s):

1. demonstrate the ability to read and analyze a text, not limited to written fiction.
2. produce a college-level essay addressing the concerns of a given assignment.
3. use appropriately chosen research material that is documented and cited correctly in MLA format.

CORE COURSES		**Units: 4.0-8.0**
Option 1 (8 units) Option 2 (4 units)		
Option 1: Select two (8 units)		
ENGL C1001	Critical Thinking and Writing	4.0
	–or–	
ENGL C1001H	Critical Thinking and Writing - Honors	4.0
ENGL 102	Literature and Composition	4.0
ENGL 102H	Honors Literature and Composition	4.0
Option 2: Select one (4 units)		
ENGL 102	Literature and Composition	4.0
	–or–	
ENGL 102H	Honors Literature and Composition	4.0