



**I. COURSE DESCRIPTION:**

Sketches, schematics, diagrams and CAD drawings are all used to convey information in the mechanical fields. CAD drawings are an essential part of graphic communication and can provide precision information not available in paper based drawings and is an integral part of interfacing with CNC processes and equipment. This course is intended to enhance the students' skills in the areas of CAD and drawing assembly and interpretation, with an emphasis on using CAD to create drawings.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

**1. *Understand technical information requirements and work flow.***Potential Elements of the Performance:

- discuss information needed for a mechanical project from inception to completion
- interpret sketches and schematics
- read specifications and interpret construction drawings

**2. *Understand the use of CAD in graphic communication and mechanical applications***Potential Elements of the Performance:

- understand the use of CAD as a precision modeling tool
- understand the X,Y,Z coordinate system
- open and save an AutoCAD drawing
- navigate a CAD drawing using pan and zoom functions
- extract information from a CAD drawing using inquiry tools such as distance, volume and area
- setup the drawing window including toolbars
- use the limits and units functions to setup a drawing
- discuss the importance of CAD file management

**3. *Create an AutoCAD drawing based on a supplied schematic***Potential Elements of the Performance:

- use the draw toolbar functions, including line, polyline and spline to create a schematic layout
- create text styles and apply text to a drawing
- use the arc, circle and ellipse functions in an AutoCAD drawing

- create, save and insert symbols into drawings

#### **4. *Recognize and apply AutoCAD setup tools***

##### Potential Elements of the Performance:

- create and use layers for different entities
- assign colours and linetypes to layers
- use dynamic input
- use ortho, snap and polar functions

#### **5. *Apply AutoCAD dimensioning techniques.***

##### Potential Elements of the Performance:

- recognize and apply different dimension styles for imperial and SI units
- apply standards of accuracy and tolerance including geometric tolerancing
- understand concepts of drawing scale
- create and apply different dimension styles

#### **6. *Edit AutoCAD drawings using the modify toolbar***

##### Potential Elements of the Performance:

- discuss the importance of editing versus drawing
- use the erase, scale, trim, extend, fillet and chamfer commands
- apply the copy, array and mirror commands
- review commands found on the modify toolbar

#### **7. *Create isometric drawings in AutoCAD***

##### Potential Elements of the Performance:

- use AutoCAD to create an isometric drawing
- apply isometric grid and snap functions
- use the ellipse isocircle option to create isometric circles
- use function key toggle between isometric drawing planes

#### **8. *Plot drawings using AutoCAD***

##### Potential Elements of the Performance:

- understand the difference between model and layout space
- setup a drawing for plotting in layout space
- create a title block in layout space
- modify and pen settings table to control line weights when plotting
- plot an AutoCAD drawing

**III. TOPICS:**

1. AutoCAD and Graphic Communication
2. Basic Model Space Window Navigation and Inquiry
3. Drawing Standards and Interpretation
4. AutoCAD Drawing Setup and Controls
5. Using the AutoCAD drawing tools
6. Using the AutoCAD modify tools
7. Dimensioning and construction tolerances
8. Isometric Drawing in AutoCAD
9. Printing and Plotting

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

*No text is required. Students will be given handouts and/or be directed to online learning resources. It is recommended students have a flash memory device for retaining backups of electronic files.*

*Optional reference text:*

*AutoCAD Pocket Reference Fifth Edition – Cheryl Shrock, Author  
Industrial Press ISBN:978-0-8311-34280*

**V. EVALUATION PROCESS/GRADING SYSTEM:**

You will be assigned a final grade on successful completion of laboratories assignments, and tests, weighted as follows:

Laboratories/Assignments	50%
Two tests of equal weight	<u>50%</u>
TOTAL	100%

Late submittals receive a maximum grade of 60%. However, laboratories or assignments handed in later than one week will receive a grade of 0.

The following semester grades will be assigned to students:

<b>Grade</b>	<b><u>Definition</u></b>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

## VI. SPECIAL NOTES:

### Electronic Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session. It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers may not be granted admission to the room.

If a student is unable to write a test on the date assigned, the following procedure is required:

- The student shall provide the Professor with advance notice preferably in writing of his/her need to miss the test.
- The student shall be required to document the absence at the discretion of the Professor. (e.g., note from doctor or lawyer)
- All decisions regarding whether tests shall be re-scheduled will be at the discretion of the Professor.
- The student shall make arrangements with the Professor, immediately upon return to the College, for the make-up of the missed test prior to the next scheduled class.
- In the event of an emergency on the day of the test, the student may require documentation to support the absence and must telephone the College to identify the absence. The college has a 24 hour electronic voice mail system (759-2554)

Students are expected to conduct themselves in a respectful and professional manner at all times.

**VII. COURSE OUTLINE ADDENDUM:**

The provisions contained in the addendum located on the portal form part of this course outline.