

I. COURSE DESCRIPTION:

This course is intended to expand on the basic skills developed from other introductory CAD courses. Students should have as a prerequisite, CAD100 or CAD120 or equal industrial experience. The student will learn how use advanced AutoCAD features such as 3D modeling (including wire frames, surfaces and solids), rendering, dynamic blocks and interface customization.

Students will also use BIM (Building Information Modeling) software to create a structural model. The model will be used to further create structural details and related construction document components such as schedules and material quantity estimates.

II. LEARNING OUTCOMES:

1. ***Prepare and interpret detailed dimensional drawings using computer assisted drafting software.***
2. ***Assist in preparing construction specifications, material and cost estimates.***
3. ***Assist in planning, scheduling and monitoring construction and civil engineering projects.***
4. ***Demonstrate relevant mathematical, computer and technical problem solving skills as it relates to civil engineering/construction projects.***

Outcome	Topic and Content	Reading	Week
1	1. Customizing AutoCAD 1.1. Customizing the user interface 1.2. Creating toolbars and basic macros	LMS	1
1	2. Blocks and Attributes 2.1. Create blocks and assign attributes 2.2. Edit attributes 2.3. Assigning attributes as fields 2.4. Extract attributes to tables 2.5. Create dynamic blocks incorporating action parameters 2.6. Use look-up tables in dynamic blocks	Online "Cadclips" LMS	2
1,4	3. AutoCAD in Three Dimensions 3.1. Understanding and Manipulating the UCS	Online "Cadclips"	3,4

	3.2. Using model space viewports 3.3. Drawing wireframe models using coordinate and polar input 3.4. Creating surface models and meshes 3.5. Creating solids and solid Boolean operations 3.6. Editing solids	LMS	
1,4	4. Materials and Rendering 4.1. Manipulate drawing display in model space and floating viewports 4.2. Use the shade command 4.3. Apply and customize the render command 4.4. Apply materials to 3D objects 4.5. Apply lighting to rendered scenes 4.6. Save and export rendered images 4.7. Create parallel line and perspective views of 3D geometry	Online	5,6
	5. Mid-term Test		7
1,3,4	6. Introduction to Building Information Modeling 6.1. Define BIM and distinguish from CAD 6.2. Discuss the concept of “smart objects” and parametric modeling 6.3. Open and create a project using Revit Structure 6.4. Save a Revit Structure Project 6.5. Describe the organization of libraries and families in Revit	Tutorials LMS	8
1,4	7. Setup a Revit Structure Project 7.1. Create a structural grid layout from a given drawing 7.2. Adjust the annotation of the structural grid 7.3. Create and edit levels in Revit Structure 7.4. Manipulate the level annotations 7.5. Identify and create views 7.6. Add dimensions to structural plans	Tutorials LMS	9,10
1	8. Add structural steel objects to a Revit Model 8.1. Edit and insert structural steel columns to grid intersections 8.2. Edit and insert steel beams and bracing to a Revit model	Tutorials LMS	11
1	9. Add concrete foundation and floor objects to a Revit Project 9.1. Edit and insert concrete column piers and footings 9.2. Edit and insert structural concrete walls and footings 9.3. Add slabs, deck and composite floor systems	Tutorials LMS	12
1	10. Create Revit drawing views 10.1. Create plans and details drawing sheets 10.2. Create and edit steel connection details 10.3. Insert rebar into plan and section details 10.4. Produce prints of foundation and connection details	Tutorials LMS	13
1,2,4	11. Schedules, quantities and lists with Revit Structure 11.1. Use Revit to create a column, beam and footing	Tutorials LMS	14

- schedules
 11.2.Prepare material lists and estimates of quantities
 using Revit tools
 11.3.Prepare and plot selected drawings

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12. Final Test**III. REQUIRED RESOURCES/TEXTS/MATERIALS:**

No textbook is required. Students will be provided with access to online resources for AutoCAD as well as Revit Structural, in addition to resources provided through LMS.

Each student should have a flash memory storage device (USB key) for backup purposes.

IV. EVALUATION PROCESS/GRADING SYSTEM:

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

Laboratories/Assignments (5-6)	50%
Mid term test	25%
Final Test	25%
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:

Grade	<u>Definition</u>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
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:

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.

Departmental Testing Policy:

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)

Conduct:

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.