SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

SAULT COLLEGE

COURSE OUTLINE

COURSE TITLE: Applied CAD II

CODE NO. : CAD 222   **SEMESTER:** 3

PROGRAM: Civil Engineering Technician

AUTHOR: B. Sparrow

DATE: September 2012   **PREVIOUS OUTLINE DATED:** September 2011

APPROVED:

"Corey Meunier"

            CHAIR   DATE

TOTAL CREDITS: 3

PREREQUISITE(S): CAD 100 or CAD 120

HOURS/WEEK: 3

Applied CAD II											CAD 222

## 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.

## III.	REQUIRED RESOURCES/TEXTS/MATERIALS:
No textbook is required. Students will be provided with access to online resources for AutoCAD as well as Revit Structure and Tekla Structures, 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	Definition	Grade Point Equivalent
A+	90 – 100%	4.00
A	80 – 89%	
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.	

V.   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.

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.

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VI. COURSE OUTLINE ADDENDUM:

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

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 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	Online "Cadclips" LMS	3,4
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 BIM software 6.4. Save a BIM project 6.5. Describe the organization of libraries and families in BIM	Tutorials LMS	8

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1,4	**7. Setup a BIM Structures 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 BIM 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 BIM Model** 8.1. Edit and insert structural steel columns to grid intersections 8.2. Edit and insert steel beams and bracing to a BIM model	Tutorials LMS	11
1	**9. Add concrete foundation and floor objects to a BIM 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 BIM 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 BIM Structure** 11.1. Use BIM to create a column, beam and footing schedules 11.2. Prepare material lists and estimates of quantities using BIM tools 11.3. Prepare and plot selected drawings	Tutorials LMS	14
	12. Final Test		15