

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**SAULT  
COLLEGE**

**COURSE OUTLINE**

**COURSE TITLE:** SURVEYING

**CODE NO. :** SUR201 **SEMESTER:** THREE

**PROGRAM:** CIVIL ENGINEERING TECHNICIAN

**AUTHOR:** SAL IENCO

**DATE:** SEPTEMBER 2014 **PREVIOUS OUTLINE DATED:** SEPTEMBER 2012

**APPROVED:**

*"Corey Meunier"*

**CHAIR**

**DATE**

**TOTAL CREDITS:** FOUR

**PREREQUISITE(S):** SUR101 & SUR122

**HOURS/WEEK:** FOUR

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## I. COURSE DESCRIPTION:

Surveying plays a key role with our built environment. As a civil technician you may have responsibilities at the initial planning, layout or construction phases of a project.

This course integrates the operations of a *total station* and *GPS* to computer software for the purpose of map creation, terrain modeling and project data management. The field work deals with topographic surveys and practical construction layout projects.

This course is a continuation of SUR101 and SUR 122.

## II. LEARNING OUTCOME:

1. Use survey instruments to collect and provide data for engineering/construction projects.
2. Adhere to applicable health and safety related legislation and practices.
3. Demonstrate relevant mathematical, computer and technical problem solving skills as it relates to civil engineering / construction projects.

## III. TOPIC OUTLINE

Outcome	Topic and Content	Reading	Week
1,2,3	<b>1. Introduction</b> <ul style="list-style-type: none"> <li>• Hand out and discuss course outline</li> <li>• Review total station set up</li> <li>• Field Activity 1 – Set up over a point</li> </ul>	LMS Handout	1
1,2,3	<b>2. Total Station Theory &amp; Field Procedures</b> <ul style="list-style-type: none"> <li>• General background</li> <li>• Total station capabilities</li> <li>• Total station field techniques</li> <li>• Station establishment</li> <li>• Data collector</li> <li>• Data capture survey</li> <li>• Introduction to Civil 3D</li> <li>• Classroom activity</li> <li>• Field Exercise 2 – Feature Point Collection</li> </ul>	LMS Handout	2

1,2,3	<b>3. Total Station Theory &amp; Field Procedure</b> <ul style="list-style-type: none"> <li>• Creating Survey Database in Civil 3D</li> <li>• Creating Survey Network in Civil 3D</li> <li>• Importing Field Book Files in Civil 3D</li> <li>• Classroom activity</li> <li>• Field Exercise 3 – Collecting Building Locations</li> </ul>	<i>LMS</i>  Handout	3
1,2,3	<b>4. Total Station Theory &amp; Field Procedure</b> <ul style="list-style-type: none"> <li>• Importing and creating points in Civil 3D</li> <li>• Creating Figure Styles and Prefixes in Civil 3D</li> <li>• Classroom activity</li> <li>• Field Exercise 4 – Collecting Linework</li> </ul>	<i>LMS</i>  Handout	4
1,2,3	<b>5. Total Station Theory &amp; Field Procedure</b> <ul style="list-style-type: none"> <li>• Managing points in Civil 3D</li> <li>• Classroom activity</li> <li>• Field Exercise 5 – Collecting Ground Shots</li> </ul>	<i>LMS</i>  Handout	5
	<b>6. Mid-term Test/Total Station</b> <ul style="list-style-type: none"> <li>• Complete field data collection</li> <li>• Produce a drawing with collected total station data</li> <li>• Simple curve theory and calculations</li> <li>• Simple curve layout</li> <li>• Classroom activity</li> <li>• Classroom presentations</li> <li>• Mid-term test</li> </ul>	<i>LMS</i>  Handout	6-7
1,2,3	<b>7. GPS Theory &amp; Field Procedures</b> <ul style="list-style-type: none"> <li>• General background</li> <li>• Receivers</li> <li>• Satellite constellation</li> <li>• GPS satellite signal</li> <li>• GPS position measurement</li> <li>• Errors</li> <li>• GPS field procedures</li> <li>• Field Exercise 6 – Collecting similar points as in the total station exercises but using GPS.</li> </ul>	<i>LMS</i>  Handout	8-9

1,2,3	<b>8. Construction Applications</b> <ul style="list-style-type: none"> <li>• General Background</li> <li>• Layout Procedures</li> <li>• Building Layout</li> <li>• Curve Layout</li> <li>• Grade Layout</li> <li>• Assignment 2</li> <li>• Field Exercise 6 – Building Measurement</li> </ul>	LMS  Handout	10-11
1,2,3	<b>9. Surfaces – Civil 3D</b> <ul style="list-style-type: none"> <li>• Creating surfaces</li> <li>• Modifying Surface</li> <li>• Creating Surface Styles</li> </ul>	Chapter 4	12-13
	<b>10. Final Exam – Practical &amp; Theory/Future Trends</b> <ul style="list-style-type: none"> <li>• Preparation for Test</li> <li>• Future Trends in Surveying</li> </ul>		14-15

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

Please note that a text is not required for this course. However, if you want to purchase a text, I recommend:

Surveying With Construction Applications  
Barry F. Kavanagh

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

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

Field/Paper Assignments	40%
Midterm Test	30%
Final Test	<u>30%</u>
 TOTAL	 100%

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

This course may differ from other courses in that you start off with a final grade of 100%. However, to maintain your 100% a perfect score is required on all specified components. If you score less than perfect on any required component final grade of 100% is reduced accordingly. In other words you lose marks out of 100% rather than earn marks up to 100%.

Please note that both paper and field assignments have to be handed in on the due date. Late submittals receive only a maximum grade of 60%. However, assignments handed in later than one week will receive a grade of 0%.

**The following semester grades will be assigned::**

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	4.00
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.	

Assignments and Examination Policy:

If a student is unable to write a test or exam at the scheduled time the following procedure shall apply:

- The student shall provide the professor with advance notice (in writing) of the need to miss the test
- The student shall provide documentation as to the reason for the absence and the make-up will be at the discretion of the professor.
- Upon return the student is responsible to make arrangements for the writing of the test. This arrangement shall be made prior to the next schedule class.
- In the event of an emergency, the student shall telephone the professor as soon as possible at 759-2554, to notify of the absence. If the professor is not available, the college has a 24 hour voice mail system.
- In the event of a test missed due to emergency, the student shall provide documentation from a professional such as doctor or lawyer.
- All late assignments (without documentation) will receive a maximum grade of C (60%).

**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.

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.

**VII. COURSE OUTLINE ADDENDUM:**

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