

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

COURSE TITLE: SURVEYING
CODE NO. : SUR101 **SEMESTER:** 1
PROGRAM: CIVIL/ENVIRONMENTAL
AUTHOR: SAL IENCO
DATE: AUG 09 **PREVIOUS OUTLINE DATED:** JUN 08
APPROVED:
"Corey Meunier" _____
CHAIR DATE
TOTAL CREDITS: 4
PREREQUISITE(S): NONE
HOURS/WEEK: 4

Copyright ©2008 The Sault College of Applied Arts & Technology
Reproduction of this document by any means, in whole or in part, without prior written permission of Sault College of Applied Arts & Technology is prohibited.
For additional information, please contact C. Meunier, Chair
School of The Natural Environment, Technology & Skilled Trades
(705) 759-2554, Ext.2610

I. COURSE DESCRIPTION:

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

This course introduces you to basic surveying principles. The topics will deal with theory, application and care of the level, distance measurement equipment and total station/theodolite. The theory is enhanced with practical field exercises.

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. REQUIRED RESOURCES/TEXTS/MATERIALS:

- **WebCT/LMS Study Guide**
- **Surveying with Construction Applications**
Barry F. Kavanagh

IV. EVALUATION PROCESS/GRADING SYSTEM:

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

Paper Assignments (total of three assignments)	15%
Quizzes (total of ten quizzes)	15%
Field assignments & Participation (total of eight activities)	20%
Mid Term Test	25%
Final Test	<u>25%</u>
TOTAL	100%

IV. 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.	

V. SPECIAL NOTES:

Prior Learning Assessment:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question. Please refer to the Student Academic Calendar of Events for the deadline date by which application must be made for advance standing.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.

Substitute course information is available in the Registrar's office.

Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of "academic dishonesty" in *Student Code of Conduct*. A professor/instructor may assign a sanction as defined below, or make recommendations to the Academic Chair for disposition of the matter. The professor/instructor may (i) issue a verbal reprimand, (ii) make an assignment of a lower grade with explanation, (iii) require additional academic assignments and issue a lower grade upon completion to the maximum grade "C", (iv) make an automatic assignment of a failing grade, (v) recommend to the Chair dismissal from the course with the assignment of a failing grade. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Student Portal:

The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, records of achievement, unofficial transcript, and outstanding obligations, in addition to announcements, news, academic calendar of events, class cancellations, your learning management system (LMS), and much more. Go to <https://my.saultcollege.ca>.

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. Late arrivers may not be granted admission to the room.

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources and weather conditions.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

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. TOPIC OUTLINE

Outcome	Topic and Content	Reading	Week
1,2,3	1. Introduction to Surveying <ul style="list-style-type: none"> • Brief history of surveying • Surveying defined • Types of surveys • Surveying instruments • Field procedure for setting up a level • Activity setting up a level 	<i>LMS</i> <i>Module 1:</i> <i>Lesson 1</i> Chapter 1	1
1,2,3	2. Accuracy and Precision/Introduction to Leveling <ul style="list-style-type: none"> • Definitions of accuracy and precision • Errors and mistakes in surveying • Classification of errors • Field book set up – data collection • Basics of surveying leveling • Leveling equations • Classroom activity • Field Exercise 1 – Leveling using one set up 	<i>LMS</i> <i>Module 1:</i> <i>Lesson 2</i> <i>Module 2:</i> <i>Lesson 1</i> Chapter 1 Chapter 2	2
1,2,3	3. Differential Leveling <ul style="list-style-type: none"> • Theory of differential leveling • Turning points • Field notes for differential leveling • Classroom activity • Field Exercise 2 – Differential leveling 	<i>LMS</i> <i>Module 2:</i> <i>Lesson 2</i> Chapter 2	3

1,2,3	4. Benchmark Leveling <ul style="list-style-type: none"> • Theory of benchmark leveling • Field notes for benchmark leveling • Variation on benchmark leveling • Classroom activity • Field Exercise 3 – Benchmark leveling • Assignment 1 	<i>LMS</i> <i>Module 2:</i> <i>Lesson 3</i> Chapter 2	4
1,2,3	5. Profile Leveling and Grade Lines <ul style="list-style-type: none"> • Theory of profile leveling • Field notes for profile leveling • Stations • Ascending and descending grades • Grade line calculations • Classroom activity • Field Exercise 4 – Profile Leveling 	<i>LMS</i> <i>Module 2:</i> <i>Lesson 5</i> Chapter 2	5
	6. Mid-term Practical Test/Accuracy Precision <ul style="list-style-type: none"> • Standards of accuracy • Accuracy and precision calculations • Classroom activity • Practical leveling test 	<i>LMS</i> <i>Module 2:</i> <i>Lesson 4</i> Chapter 2	6
1,2,3	7. Mid-term Theory Test/Measurement of Distances <ul style="list-style-type: none"> • Pacing • Odometers • Stadia • Electronic distance measurement instruments • Classroom activity • Field Exercise 5 - Pacing 	<i>LMS</i> <i>Module 3:</i> <i>Lesson 1</i> Chapter 3	7
1,2,3	8. Tape Measurement Procedures <ul style="list-style-type: none"> • Tape accessories • Procedure for measuring on level and sloping ground • Errors and mistakes in taping • Taping calculations • Filed notes for taping • Classroom activity • Assignment 2 • Field Exercise 6 – Building Measurement 	<i>LMS</i> <i>Module 3:</i> <i>Lesson 2,3,4</i> Chapter 3	8
1,2,3	9. Introduction to Total Stations Theodolites <ul style="list-style-type: none"> • General background • Reference directions for vertical angles • Meridians • Horizontal angles • Classroom activity • Field Exercise 7 – Set up of optical plumb Theodolite and angular measurement 	Chapter 4	9

1,2,3	<p>10. Angular Arithmetic and Traverse Surveying</p> <ul style="list-style-type: none"> • Basic Trigonometric review • Azimuths • Bearings • Relationship between azimuths and bearings • Azimuth and bearing calculations for open and closed traverses • Laying off angles and distances • Classroom activity • Tutorial – azimuth and bearing calculations • Assignment 3 • Field Exercise 8 – Traverse measurement 	<p><i>LMS</i> <i>Module 4:</i> <i>Lesson 2,3</i></p> <p>Chapter 6</p>	10-11
1,2,3	<p>11. Practical Applications using total Stations and Theodolites</p> <ul style="list-style-type: none"> • Prolonging a straight line • Intersecting between two points • Intersecting a line • Prolonging a straight line past an obstacle • Field exercise 9 - Layout of simple object using a given reference line • Classroom activity 	<p><i>LMS</i> <i>Module 4:</i> <i>Lesson 4</i></p> <p>Chapter 4</p>	12
1,2,3	<p>12. Checking Instrument Calibration/Future of Surveying</p> <ul style="list-style-type: none"> • Peg test theory and procedure • Theory and procedure for checking the total station • Presentations on future trends for surveying 	<p><i>LMS</i> <i>Module 3:</i> <i>Module 4:</i></p> <p>Chapters 3,4 & 6</p>	13
	<p>13. Final Exam – Practical & Theory/Looking Forward</p> <ul style="list-style-type: none"> • Review for final test • Future Trends in Surveying • Tie in to Spring Surveying Camp 		14-15