

**Western University - Faculty of Engineering
Department of Civil and Environmental Engineering**

CEE 3324a – Surveying – Course Outline 2023

This course provides the student with an introduction to basic aspects of the theory and practice of plane surveying within the context of Civil Engineering. The use of AutoCAD to produce engineering drawings is also emphasized. The general objectives are for the student to become able to:

- Recognize the place and importance of surveying in an engineering context
- Use surveying equipment to perform basic measurements of elevations, distances and angles
- Identify sources of error in measurements, apply appropriate corrections and evaluate the influence of error on subsequent calculations
- Use measured data to calculate design parameters
- Use AutoCAD to produce effective engineering drawings

Calendar Copy:

The fundamental theory and procedures of plane surveying with application to engineering construction. Introduction to the use of AutoCAD to produce civil engineering drawings.

Prerequisites:

Enrolled in Civil Engineering

Corequisites:

none

Note: It is the **student's responsibility** to ensure that all Prerequisite and Corequisite conditions are met or that special permission to waive these requirements has been granted by the Faculty. It is also the **student's responsibility** to ensure that they have not taken a course listed as an Antirequisite. The student may be dropped from the course or not given credit for the course towards their degree if they violate the Prerequisite, Corequisite or Antirequisite conditions.

Extra Information:

26 lecture hours, 52 lab/fieldwork hours over two weeks. This course runs in the summer for a period of 10 days (usually the two weeks preceding the start of the fall term). Limited enrolment. Preference will be given to students who have completed term 4 of the Civil Engineering program. Due to the concise nature of the course, students must attend the first class in order to be enrolled, and the last date for dropping the course is at the end of classes on the fourth day.

Contact Hours:

9:00am – 6:00pm for 10 days from August 21 – September 1. Consult the attached course schedule for further details.

Attendance at **all** fieldwork sessions is **mandatory**. Lecture material will be posted to the course OWL site. Students are expected to review relevant lecture material prior to attending fieldwork exercises.

Instructor:

Dr. Jon Southen, Ph.D, P.Eng.
SEB 3116, jsouthen@uwo.ca

Textbook:

Course notes will be made available through the course website (<http://owl.uwo.ca>).

Other References:

Surveying, J.C. McCormac, Wiley, 2015, 6th Edition.
<https://www.vitalsource.com/referral?term=9781118324226> (optional)

AutoCAD 2016 and AutoCAD LT 2016 Essentials: Autodesk Official Press, S. Onstott, Sybex, 2015
<https://www.vitalsource.com/referral?term=9781119059202> (optional)

Elemental surveying: an introduction to geomatics, C.D. Ghilani and P.R. Wolf, Pearson, 14th Edition, 2015.

Laboratory:

This course comprises both surveying field work and AutoCAD assignments, which will be carried out as indicated on the attached (tentative) schedule. Dates and times are subject to change due to weather conditions.

Computing:

Students will use AutoCAD to prepare drawings during tutorial sessions. All students should install AutoCAD software on their personal computers prior to the start of the course. The latest version of AutoCAD is available (free) from: <https://www.autodesk.com/education/free-software/autocad>

Units:

Both SI and US units will be used in lectures and examinations

Specific Learning Objectives:

Where applicable, students will learn to make field notes in a “standard format”.

The field work and laboratory assignments will prepare students to do the following [GA Indicator]:

1. Run a level loop to third order accuracy using an automatic level. [I1, ET1, ET2]
2. Chain the distances of a closed traverse to an accuracy of 1 in 3000. [I1, ET1, ET2]
3. Measure the internal angles of a closed traverse using a digital theodolite. [I1, ET1, ET2]
4. Use data from 2. and 3. above to perform a mathematical closure on the measured loop traverse. [I1, I3]
5. Tie topographical details into the closed traverse. [I1, ET1, ET2]
6. Present the above information on a topographic plan. [CS2]
7. From a given benchmark and base line determine the coordinates and elevation of a nearby point. [I1, I3, ET1, ET2]
8. Calculate data for horizontal and vertical curves. [PA1]
9. Given two (or three) control stations and their coordinates and appropriate design data for a section of highway, layout the curves and set grades based on the calculations done in 8. [I1, ET1, ET2]
10. Produce topographic plans in AutoCAD. [CS2]
11. Create plan, profile, and cross section drawings in AutoCAD. [CS2]
12. Develop teamwork and group management skills. [ITW1, ITW2, ITW3]
13. Recognize the importance of surveying within the civil engineering context. [KB4]

General Learning Objectives:

E=Evaluate, T=Teach, I=Introduce; (I) = Introduction, (D) = Developing, (A) = Advanced level

Problem Analysis	I	Team Work	E (D)	Ethics and Equity	
Investigation	E (D)	Communication	T	Economics and Project Management	
Design		Professionalism	I	Life-Long Learning	I
Engineering Tools	E (D)	Impact on Society			

Evaluation:

The final mark will be determined as follows:

AutoCAD assignments	25%
Field work assignments	50%
Final Examination	<u>25%</u>
Total	100%

Note: (a) **Students must obtain an average of 50% on each of the above components to pass the course.** If a student fails any component, the student will be assigned the aggregate mark as determined above or 48%, whichever is less.

(b) **Students must turn in all field and AutoCAD assignments and achieve a passing grade in the assignment component, to pass this course.** Students who do not satisfy this requirement will be assigned 48% or the aggregate mark, whichever is less.

(c) **Students who have failed this course previously must repeat all components of the course.** No special permissions will be granted enabling a student to retain laboratory, assignment or test marks from previous years. Previously completed assignments and laboratories cannot be resubmitted.

Examinations:

A three-hour, open book FINAL EXAMINATION will be held following the completion of class, tentatively scheduled for **Tuesday, September 5 from 1:00 pm to 4:00 pm.**

Assignments

Assignments will be due as indicated on the posted class schedule. Note that weather or field conditions may necessitate a change in due date, which will be communicated by the instructor through the course OWL site. All assignments will be submitted in electronic format to the course OWL site.

Use of English

In accordance with Senate and Faculty Policy, students may be penalised up to 10% of the marks on all assignments, tests, and examinations for the improper use of English. Additionally, poorly written work with the exception of the final examination may be returned without grading. If resubmission of the work is permitted, it may be graded with marks deducted for poor English and/or late submission.

Cheating:

University policy states that cheating is a scholastic offence. The commission of a scholastic offence is attended by academic penalties that might include expulsion from the program. If you are caught cheating, there will be no second warning.

For more information on scholastic offenses, please see:

http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf

Attendance:

Any student who, in the opinion of the instructor, is absent too frequently from class, laboratory, or tutorial periods will be reported to the Dean (after due warning has been given). On the recommendation of the Department concerned, and with the permission of the Dean, the student will be debarred from taking the regular final examination in the course.

Accessibility:

Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

Conduct:

Students are expected to arrive at lectures and fieldwork sessions on time, and to conduct themselves during class in a professional and respectful manner that is not disruptive to others. On the premises of the University or at a University-sponsored program, students must abide by the Student Code of Conduct:

<http://www.uwo.ca/univsec/board/code.pdf>

Sickness and Other Problems:

Students should immediately consult with the Instructor or Department Chair if they have any problems that could affect their performance in the course. Where appropriate, the problems should be documented (see attached). The student should seek advice from the Instructor or Department Chair regarding how best to deal with the problem. Failure to notify the Instructor or Department Chair immediately (or as soon as possible thereafter) will have a negative effect on any appeal.

For more information concerning medical accommodations, please see:

http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf

Notice:

Students are responsible for regularly checking their email and notices posted outside the Civil and Environmental Engineering Department Office

Consultation:

Students are encouraged to discuss problems with their teaching assistant and/or instructor in tutorial sessions. Office hours will be arranged for the students to see the instructor and teaching assistants. Other individual consultation can be arranged by appointment with the appropriate instructor.

Course breakdown:

Engineering Science = 100%

STATEMENT ON GENDER-BASED AND SEXUAL VIOLENCE

Western [is committed to reducing incidents of gender-based and sexual violence](#) and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced gender-based or sexual violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts, [here](#). To connect with a case manager or set up an appointment, please contact support@uwo.ca.

INSTRUCTIONS FOR STUDENTS UNABLE TO WRITE TESTS OR EXAMINATIONS OR SUBMIT ASSIGNMENTS AS SCHEDULED

If, on medical or compassionate grounds, you are unable to write term tests or final examinations or complete course work by the due date, you should follow the instructions listed below. You should understand that academic relief will not be granted automatically on request. You must demonstrate to your department (or the Undergraduate Services Office) that there are compelling medical or compassionate grounds that can be documented before academic relief will be considered. Different regulations apply to term tests, final examinations and late assignments. Please read the instructions carefully.

A. GENERAL REGULATIONS & PROCEDURES

1. All first-year students will report to the Undergraduate Services Office by submitting the [Academic Consideration Request Form](#), for all instances.
2. If you are an upper year student and you are missing a test/assignment/lab or examination you will report the absence by submitting [Academic Consideration Request Form](#). Absences worth LESS THAN 10% of your mark, will be processed by your department office. If your course work is worth 10% OR MORE of your final grade, your request will be processed by the Undergraduate Services Office.
3. Check the course outline to see if the instructor has a policy for missed tests, examinations, late assignments or attendance.
4. Documentation must be provided as soon as possible. If no one is available in your department office or the Undergraduate Services Office, leave a message clearly stating your name & student number and reason for your call. The department telephone numbers are given at the end of these instructions.
5. If you decide to write a test or an examination you should be prepared to accept the mark you earn. Rewriting tests or examinations or having the value of a test or examination reweighted on a retroactive basis is not permitted.

B. TERM/MIDTERM TESTS

1. If you are in first year and you are unable to write a midterm/term test, contact the Undergraduate Services Office, SEB 2097 PRIOR to the scheduled date of the test.
2. If you are an upper year student and you are unable to write a midterm/term test, inform your instructor PRIOR to the scheduled date of the test and request relief through the [Academic Consideration Request Form](#). If the instructor is not available, leave a message for him/her at the department office. If the test is worth LESS THAN 10% of your mark, your request for relief will be processed by your department office. If the test is worth MORE THAN 10% of your final grade your request for relief will be processed by the Undergraduate Services Office.
3. Be prepared to attach supporting documentation to the Department Chair and/or the Undergraduate Services Office through the online form (see next page for information on documentation).
4. Discuss with the instructor if and when the test can be rescheduled. The approval of the Chair or the Undergraduate Services Office is required when rescheduling midterm/term tests.

C. FINAL EXAMINATIONS

1. If you are unable to write a final examination, contact the Undergraduate Services Office **PRIOR TO THE SCHEDULED EXAMINATION TIME** to report your absence using the [Academic Consideration Request Form](#) and request permission to write a Special Final Examination. If no one is available in the Undergraduate Services Office, leave a message clearly stating your name & student number.
2. Be prepared to provide the Undergraduate Services Office with supporting documentation (see next page for information on documentation) the next day, or as soon as possible (in cases where students are hospitalized). The following circumstances are not considered grounds for missing a final examination or requesting special examinations: common cold, headache, sleeping in, misreading timetable and travel arrangements.
3. In order to receive permission to write a Special Examination, you must obtain the approval of the Chair of the Department **and** the Associate Dean and in order to apply you must submit an "[Application for a Special Exam](#)" form. The Undergraduate Services Office will then notify the course instructor(s) and reschedule the examination on your behalf.

PLEASE NOTE: It is the student's responsibility to check the date, time and location of the Special Examination.

D. LATE ASSIGNMENTS

1. Advise the instructor if you are having problems completing the assignment on time (**prior** to the due date of the assignment).
2. Be prepared to submit the [Academic Consideration Request Form](#) and provide documentation if requested by the instructor (see reverse side for information on documentation).
3. If you are granted an extension, establish a due date. The approval of the Chair of your Department (or the Assistant Dean, First Year Studies, if you are in first year) is not required if assignments will be completed prior to the last day of classes.
4. i) Extensions beyond the end of classes must have the consent of the instructor, the department Chair and the Associate Dean, Undergraduate Studies. Documentation is mandatory.
- ii) A Recommendation of Incomplete Form must be filled out indicating the work to be completed and the date by which it is due. This form must be signed by the student, the instructor, the department Chair and the Associate Dean, Undergraduate Studies.

E. SHORT ABSENCES

If you miss a class due to a minor illness or other problem, check your course outlines for information regarding attendance requirements and make sure you are not missing a test, laboratory or assignment. Cover any readings and arrange to borrow notes from a classmate.

F. EXTENDED ABSENCES

If you are absent more than one week or if you get too far behind to catch up, you should consider reducing your workload by dropping one or more courses. (Note drop deadlines listed below). You are strongly encouraged to seek advice from your Academic Counsellor in the Undergraduate Services Office.

G. DOCUMENTATION

If you consulted an off-campus doctor or Student Health Services regarding your illness or personal problem, **you must provide the doctor with a Student Medical Certificate** to complete at the time of your visit and then bring it to the Department (or the Undergraduate Services Office). **This note must contain the following information: severity of illness, effect on academic studies and duration of absence. Regular doctor's notes will not be accepted; only the Student Medical Certificate will be accepted.**

In Case of Serious Illness of a Family Member: Provide a Student Medical Certificate to your family member's physician to complete and bring it to the Department (or the Undergraduate Services Office if you are in first year).

In Case of a Death: Obtain a copy of the death certificate or the notice provided by the funeral director's office. You must include your relationship to the deceased and bring it to the Department (or the Undergraduate Services Office if you are in first year).

For Other Extenuating Circumstances: If you are not sure what documentation to provide, ask the Departmental Office (or the Undergraduate Services Office if you are in first year) for direction.

Note: Forged notes and certificates will be dealt with severely. To submit a forged document is a scholastic offence (see below).

H. ACADEMIC CONCERNS

1. You need to know if your instructors have a policy on late penalties, missed tests, etc. This information may be included on the course outlines. If not, ask your instructor(s).
2. You should also be aware of attendance requirements in some courses. You can be debarred from writing the final examination if your attendance is not satisfactory.
3. If you are in academic difficulty, check out the minimum requirements for progression in the calendar. If in doubt, see your Academic Counsellor.

Calendar References: Check these regulations in your 2023 Western Academic Calendar available at www.westerncalendar.uwo.ca.

Absences Due to Illness:

https://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_135

Academic Accommodations for Students with Disabilities:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_10

Academic Accommodations for Religious or Holy Days:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_16

Course Withdrawals:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=6&SelectedCalendar=Live&ArchiveID=#Page_75

Examinations:

<http://www.westerncalendar.uwo.ca/PolicyPages.cfm?PolicyCategoryID=5&command=showCategory&SelectedCalendar=Live&ArchiveID=>

Scheduling of Term Assignments:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=5&SelectedCalendar=Live&ArchiveID=#SubHeading_78

Scholastic Offences:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_20

Student Medical Certificate:

<https://www.eng.uwo.ca/files/undergraduate/student-medical-certificate.pdf>

Engineering Academic Regulations:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=4&SelectedCalendar=Live&ArchiveID=#Page_86

Note: These instructions apply to all students registered in the Faculty of Engineering regardless of whether the courses are offered by the Faculty of Engineering or other faculties in the University.

Add Deadlines:

September 15, 2023 First term half course (i.e. “A” or “F”)
September 15, 2023 Full courses and full-year half course (i.e. “E”, “Y” or no suffix)
January 16, 2024 Second term half course (i.e. “B” or “G”)

Drop Deadlines:

November 13, 2023 First term half course without penalty (i.e. “A” or “F”)
November 30, 2023 Full courses and full-year half courses without penalty (i.e. “E”, “Y” or no suffix)
March 7, 2024 Second term half or second term full course without penalty (i.e. “B” or “G”)

Contact Information:

Undergraduate Services Office: engugrad@uwo.ca	SEB 2097 Phone: 519-661-2130	E-mail:
Chemical & Green Process Engineering: cbeugrad@uwo.ca	TEB 477 Phone: 519-661-2131	E-mail:
Civil Engineering: civil@uwo.ca	SEB 3005 Phone: 519-661-2139	E-mail:
Computer, Electrical, Mechatronic Systems & Software Engineering ecceugrad@uwo.ca	TEB 279 Phone: 519-661-3758	E-mail:
Integrated Engineering engceli@uwo.ca	ACEB 2410 Phone: 519-661-6725	E-mail:
Mechanical Engineering: mmeundergraduate@uwo.ca	SEB 3002 Phone: 519-661-4122	E-mail: