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.

**Prequisites:**
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 – 5:00pm for 10 days from August 23 – September 3. 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:**

https://www.vitalsource.com/referral?term=9781118324226 (optional)

https://www.vitalsource.com/referral?term=9781119059202 (optional)


**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]
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

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Evaluation:
The final mark will be determined as follows:

- AutoCAD assignments 25%
- Field work assignments 50%
- Final Examination 25%
- 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 7 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](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](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](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%