CE 2A03 – SURVEYING AND MEASUREMENT
COURSE OUTLINE – Fall 2017

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GRADUATE TEACHING ASSISTANTS
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CLASSES  Wednesdays  8:30-9:20  BSB B135
          Fridays  10:30-11:20  BSB B135

LABS  LAB L01 (Section 1): Friday 2:30-5:20  ADL
       LAB L02 (Section 2): Thursday  8:30-11:20  ADL
       LAB L03 (Section 3): Wednesday  2:30-5:20  ADL

TUTORIALS  Tutorial T01 (Section 1): Wednesday 9:30-11:30  JHE 326H
           Tutorial T02 (Section 2): Monday 9:30-11:20  BSB 120

COURSE OBJECTIVES
This course will provide an introduction to civil engineering surveying and measurement
principles. Lectures will cover the theory underlying construction surveying and
experimental measurements, with selected concepts illustrated through field labs and
classroom tutorials.

COURSE CONTENT*
In this course we will cover:
  • Proper Measurement Techniques
  • Fundamentals of Distance and Angular Measurement
  • Levelling/Topographic Surveys
  • Horizontal and Vertical Curves
  • Municipal and Highway Surveying
  • Topographic Mapping
  • GPS Surveying

*The above is a tentative list of topics anticipated to be covered.

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment
on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

**LEARNING OBJECTIVES:**

It is the expectation of the Civil Engineering department and the instructor that the students achieve the following learning objectives:

1. An ability to operate modern surveying equipment, including total stations and stationary levels.
   - Linkage to CEAB graduate attribute(s): 3.3, 5.1 and 5.2
2. An ability to quantify the error from a field survey, whether a surveying a closed traverse or an elevation survey.
   - Linkage to CEAB graduate attribute(s): 3.3 and 5.1
3. That the student is able to assess which points are appropriate to survey for well-defined topographic mapping.
   - Linkage to CEAB graduate attribute(s): 3.3

**LECTURES AND TUTORIALS**

The lectures will be used to present theoretical/design background and some illustrative examples.

The tutorials will be used to demonstrate additional examples, provide assistance with problem solving, and for special presentations. Students may be required to submit work at the end of the tutorial. In certain situations the tutorial session may also be used to give a lecture; you will be notified in advance if this will occur. It is your responsibility to check CIV ENG 2A03 on the course website on a regular basis.

**EVALUATION**

Your final grade in the course will be computed as:

- Survey Lab Reports: 30% (group)
- Assignments: 25% (individual)
- Mid-Term Test: 15% (individual)
- Final Exam: 30% (individual)

**NOTE – you must pass the lab component of the course to attain a passing grade for the course.**

The midterm is not yet scheduled – it will likely be two hours long. Details will be announced. The final percentage grade will be converted to a letter grade using the Registrar's scale.
FIELD BOOKS
Each laboratory group must obtain a Field Note Book (from the teaching assistant). Field books remain the property of McMaster University and MUST be returned to the instructor before laboratory grades will be counted toward the final grade.

Field books must be submitted to a TA, and initialled by the TA, at the end of each lab. Field books are to be submitted for final evaluation in the CE2A03 drop box in JHE and will be returned at the start of the next lab.

ATTENDANCE
Laboratory and lecture attendance is mandatory. Since a large portion of this course is field labs, attendance and participation will be noted by the teaching assistant and factored into the final grade. If you do not attend a field laboratory, you will receive a zero grade for that component.

ASSIGNMENTS
The purpose of the assignment problems is to give you an opportunity to develop an in-depth understanding of the course material. While discussion with other students of the background and approach to solution of problems is often beneficial, you need to ensure that you can actually solve each problem on your own (i.e., the way it will be during the final exam). All work that you submit for grading must be your own work. Assistance on working out these problems will be available during the tutorial sessions. Assignments that have not been given permission to be handed in late by the instructor, prior to the due date, will be assigned a value of zero, there will be no exceptions to this.

SUGGESTED REFERENCE TEXTS

Kavanagh, B.F. Surveying: Principles and Applications, Prentice-Hall, any edition from 5-9 would be sufficient

CONDUCT
Students are expected to arrive at lectures, tutorials, and labs on time, and conduct themselves in a professional and respectful manner that is not disruptive to others. Cellular telephones shall be turned off during lectures, labs, and tutorial periods.

ADVERSE DISCRIMINATION
The Faculty of Engineering is concerned with ensuring an environment that is free of all adverse discrimination. If there is a problem that cannot be resolved by discussion among the persons
involved, individuals are reminded that they should contact their Department Chair, the Sexual Harassment Office or the Human Rights Consultant, as soon as possible.

ETHICS
Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, specifically Appendix 3, located in: http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf

The following illustrates only three forms of academic dishonesty:
   1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
   2. Improper collaboration in group work.
   3. Copying or using unauthorized aids in tests and examinations.

LABORATORY SAFETY
The Faculty of Engineering is committed to McMaster University’s Workplace and Environmental Health and Safety Policy which states: "Students are required by University policy to comply with all University health, safety and environmental programs". It is your responsibility to understand McMaster University Workplace and Environmental Health and Safety programs and policies. For information on these programs and policies please refer to McMaster University Environmental and Health Support Services Occupational Safety Risk Management Manual at: http://www.workingatmcmaster.ca/med/document/Lab-Safety-Handbook-1-36.pdf. It is also your responsibility to follow any specific Standard Operating Procedures (SOPs) provided for some of the experiments and the laboratory equipment.

Laboratory Instructions specific to the CIV ENG 2A03 laboratory work are as follows:

- No running is allowed
- No one will create a situation that could compromise or jeopardize the safety of themselves or anyone else in the lab
- Watch for traffic
- Do not touch parked vehicles
- Carry instruments in their case, by the handle
- Do not carry more than you can handle
Total Stations measure distances by firing a low power infra-red laser into a reflector and back to the instrument. Although the laser is not powerful enough to cause damage, do not fire the laser into anyone's eyes.

- Instruments are expensive - be careful
- Obey all instructions given to you by the Teaching Assistant and / or lab technical staff
- The lab is held outside, in all weather conditions- dress accordingly
- The lab will be postponed in the event of lightning.
- For labs being done in the area of the helipad: If a helicopter is landing or taking off from the helipad you must place the instruments and tools on the ground and move directly away from the helipad. No one should be within 100m of the helipad while the helicopter rotors are turning. The down wash from the helicopter can throw debris a long distance. Once the rotors have stopped turning or the helicopter has left the area, you may return to continue the lab.

Failure to comply with safety rules, will result in the individual student being denied access to the lab and given a ‘did not complete’ grade for the lab session.