I.) INTRODUCTION

A.) General Information

Instructor: Tony Endres (2009 EIT / ext. 33552)
alendres@uwaterloo.ca

B.) Course Grade

The grade for Earth 461 has following three (3) components:

1.) Assignments (60% of course mark)
2.) Midterm Exam (13% of course mark)
3.) Final Exam (27% of course mark)

The grade for Earth 668 has following three (3) components:

1.) Assignments (70% of course mark)
2.) Term Paper (20% of course mark)
3.) Presentation of Term Paper (10% of course mark)

C.) Midterm Examination

The midterm examination will be given on the **evening** of **Wednesday 19 October 2016**.

D.) Assignments

1.) There will be approximately 6-7 assignments covering topics from the lecture regarding principles and data analysis.

2.) All submitted assignments must conform to the following requirements:

a.) All assignments are to be submitted on standard Letter size (8.5 x 11 inch) paper.

b.) Paper torn out of spiral notebooks is **not** acceptable.

c.) Your solutions are to be arranged in numerical order of the questions on the assignment.

d.) Multiple pages must be stapled together before submitting.

e.) **Assignments not conforming to these requirements will be penalized**.

3.) **Hand draw** graphs are **not** acceptable for submitted assignments.

a.) Hand draw graphs will **not** be graded and **zero points** will be given for that element of the assignment problem.

b.) It is highly recommended that you use spreadsheet software to generate your graphs.

c.) If necessary, you may use commercial graph paper or gridded engineering paper.

4.) Due dates on assignments are firm; late assignments will be assess a penalty of 25% for the first week and 50% for the second week. After two weeks, assignments will no longer be accepted for grading.

5.) Extensions will only be granted for very exceptional circumstances and need to be arranged in advance.

6.) All assignments in Earth 461 & 668 are individual assignments (i.e., completed by each student independently).

E.) 668 Term Paper

This paper will be a literature review of a near-surface geophysical technique or application to hydrogeological / geotechnical / archeological problem. Topics are to be chosen by the student and need the approval of the course instructor.

Topics need to be selected and approved by October 15, 2014.

The term paper is due the first day of the final exam period.

Presentations of term paper will be done in class during the last week of classes. It will be approximately 30 minutes in length and will be followed by a question and answer period.

F.) Evaluation of Submitted Work

1.) All assignments submitted for grading in Earth 461/668 are to be only the personal work the individual submitting that work.

2.) While students in this class are strongly encouraged to discuss the assignments and field exercise among themselves, each student must individually fulfill the requirements of the assignment and field exercise.

3.) ***Collaborative work submitted for grading will not be accepted. Submitted assignments deemed to be the product of collaborative work will receive a mark of 0%.***

4.) ***Use of materials from previous years in the preparation of assignments is prohibited. Submitted assignments that are deemed to have used materials from previous years will receive a mark of 0%.***

5.) It is the responsibility of each student to be aware of what constitutes responsible behaviour in class, what constitutes plagiarism, and your rights and responsibilities with respect to these issues. The University of Waterloo has policies on these issues, which are outlined in the undergraduate calendar and are available on the University of Waterloo Websites at:

http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm

http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm

More information regarding academic integrity issues is found at:

http://uwaterloo.ca/academicintegrity/index.html

If in doubt, ask me. I am more than happy to give you guidance in these matters in order to avoid potential problems.

6.) By University of Waterloo policy, I am required to report ALL suspected violations of academic integrity to the appropriate university authorities.

G.) Textbook and Additional References

1.) Required textbook for Earth 461 / 668:
Mark E. Everett, *Near-Surface Applied Geophysics*

2.) Material in this textbook will be specified as assigned readings for this course. Students are **required** to read this material; it will be covered in the assignments, midterm exam and/or final exam.

3.) In addition, there are several supplemental books that are excellent resource material for this course:

John M. Reynolds, *An Introduction to Applied and Environmental Geophysics (2nd Edition)*

Dwain K. Butler (Editor), *Near-Surface Geophysics* (This book is available through the Society of Exploration Geophysicists at a discount for student members)

Reinhard Kirsch (Editor), *Groundwater Geophysics,* Springer (available from the UW Library in electronic form)

4.) Further, I will give you references to some review papers that have appeared in the literature. It is recommended that you go through these papers.

H.) Outlines of Topics Covered in this Course

1.) Overview of Inverse Methods

2.) Resistivity Methods

3.) Induced Polarization Method

4.) Self Potential Method

5.) Electromagnetic (EM) Induction Methods (Frequency & Time Domain, Magnetic Resonance Sounding)

6.) Ground Penetrating Radar (GPR) Methods

7.) Seismic Methods (Reflection / Refraction / Surface Waves)

8.) Time permiting: Magnetics, Gravity and/or Borehole Methods