ELEC 344: Applied Electronics and Electromechanics

1. General Information and Laboratory Rules

Laboratory experiments are an integral part of many courses that cover electromechanical energy conversion devices and their applications. To make laboratory experiments safe and effective, the following rules must be obeyed by all students:

1.1. Safety Rules

a) All domestic and international students are required to have adequate medical insurance that covers any possible injuries that may occur while in the Laboratory.

b) Students are not permitted to conduct experiments in this Laboratory on their own time without being supervised or accompanied by a TA or Lab Engineer responsible for the lab.

c) Prior to conducting any measurements, all students starting the lab sessions in MCLD 130 have to be familiarized with these **Safety Rules** and acknowledge this by their signature in the **Sign-up Sheet. The course Instructor or TAs are responsible for providing the Sign-up Sheet**.

d) Your safety is most important. High voltage equipment in the power lab **can** cause serious **injuries or death**. For increased safety, the normal laboratory experiments should be conducted using reduced voltages not exceeding **50 Volts** DC or AC.

e) Always double-check your wiring circuit. Avoid short circuits and/or inappropriate use of equipment. The power supplies in the lab are capable of delivering **very high current**. High current can lead to fire, heat hazards, explosions, etc., and result in injury and damage to equipment.

f) Have your circuit checked by a TA and/or Lab Engineer whenever necessary, especially if you are not sure and/or getting suspicious results or measurements.

g) The laboratory includes rotating machines and moving actuators that are capable of delivering high speed, torque and force. **Moving mechanical objects can cause serious injuries and damage to equipment, if used or applied inappropriately**.

h) To avoid hazardous situations, always **cover the dynamometer** machine with the protective plastic cover, **tightly couple and secure the subject electrical machine** or device (motor or actuator) under study with special screws.

i) **Never stick your hands or any other objects** near the moving parts (shafts, couplings, etc.) of the machine while operating.

j) Wear appropriate **clothing and hair style** that **is not likely to get in the way of rotating machinery and moving parts!**

k) Report any malfunction and/or failure of equipment to the TA and the Lab Engineer responsible for the lab.

l) In the case of accident, immediately notify the TA and/or Lab Engineer responsible for the lab, your fellow students/partners, and seek immediate appropriate medical help. **In the case of emergency, call 911.**

m) N**o food and/or beverages** are allowed in the laboratory at any time.

n) Students carry full responsibility for any consequences, injuries and/or damages caused by (or as consequence of) their negligence and/or inappropriate behavior in the laboratory, or any other violation of the safety rules and precautions.

1.2. Attendance

a) All students are required to attend and perform adequately. In order to pass this course, each **student (group of students who are partners) is (are) required to write reports for all experiments**.

b) Attendance will be recorded by a TA. A **Sign-up Sheet** will be provided at the **beginning** and at the **end** of **every lab session**.

   i) **In the beginning** of each lab, each student must **Sign-In** in the appropriate Sign-up Sheet for that section, thereby acknowledging his/her presence and compliance with the above **Safety Rules**.

   ii) **Upon completing the experiment**, each student will have to clean up the work place and return the equipment and wires back to their original place. After the bench is checked by a TA, each student will have to **Sign-Out**.

c) Failure to be present for an experiment will result in losing the entire mark for the corresponding lab.

d) Students must not attend a different lab group/section from the one assigned at the beginning of the class, unless otherwise approved by the instructor. Attendance in the wrong group will be subject to a reduced lab mark of **up to 50%.**

e) If a student misses a lab session due to illness and/or family crisis and can provide a legitimate proof, he/she may be able to attend a different lab section or a make-up session. In such cases the student should contact the instructor as soon as possible and make appropriate arrangements/agreements about performing the lab at another time.

1.3. Preparation and Performance

a) Before coming to the laboratory, each student **must read and review the appropriate sections of the lecture notes**, **textbook chapters**, as well as the **Lab Manual** for the current **Lab Experiment**. In particular, each student must **read** the **Tasks** and perform all necessary preparation (**Pre-Lab**) tasks corresponding to the Lab Experiment that is to be performed at that day.

b) The TA will check your preparedness and the Pre-Lab sheet and may reduce your mark by up to **40%** or even **dismiss you** from the lab **if you are not ready** to do the experiments.

c) Record your **own** observations and calculations. The time for the lab is limited and you should use it very effectively to complete all the tasks and measurements. Be sure to record and present all your data very clearly.

d) The TA may reduce your lab mark by as much as **50%** if you are noted to be busy with unrelated activities and/or disruptive to other students.

e) The TAs may not let you **Sign-Out** before your work bench is properly cleared. Leaving the lab without **Sign-Out** will invalidate your present lab and you will have to repeat it.

1.4. Accessing the Lab Computer (PC)

a) You will need to login into the PC on your Lab Bench. You should login using your own UBC ECE computer account. Alternatively, the TA should provide you with the class login account and the corresponding password.

b) Please do not leave any of your files on the class account Desktop. After completing the experiment, store all your data files into your personal USB flesh drive, or email it to yourself from the lab computer, and remove all your data files from the lab PC.

1.5. Lab Reports

1.5.1. Preparing the Report

a) In order to pass this course, each student (or group of students) is (are) required to complete measurements and write **Lab Reports for all experiments**.

b) Students may discuss among themselves the problems in each lab experiment, equally share the work and produce the group report.

c) The calculations can be quite challenging. The students are encouraged to use advanced computational tools such as **Matlab**, **Excel**, etc. for calculations and plotting the results.

d) Students are encouraged to discuss among themselves the problems in each lab experiment. However, the turned-in Lab Reports must show the individual work and reflect the individual understanding of material by each student (or the group of students). The percent participation (%) of each student should be clearly indicated on the title page. Each student must sign the title page certifying that he/she participated in taking the measurements and preparing a given report.

e) **Reports suspected of cheating will not be graded**. Cheating will result in **zero mark (0)** and may qualify for withdrawal form the course and/or suspension from the University. Please see the UBC Regulation on Cheating and Plagiarism. All instances of cheating will be reported according to this policy.

f) All reports must be typed. No exceptions.

g) The Lab report **must contain at least** the following:

1. Title Page (see sample Title Page below)
2. Pre-Lab (if any), signed and dated by one of the TAs.
3. Pages with measured data. The tables of measurements are included in the manual for most of the experiments. These pages with tables must contain your own measurements/calculations and be signed/dated by your TA.
4. For each task, include necessary diagrams, tables of measurements, figures, graphs, equations, calculations, notes, etc.
5. **Calculations & Analysis:** include appropriate equations, calculations, comments and observations. Summarize the parameters of the studied device in a Table.
6. **Summary Section:** This section should include answers to the additional questions (if any). Here, you should also briefly state and summarize what you have learned doing the experiments and subsequent calculations.

h) When preparing a report, you may cross-reference presentation of data and/or observations to the Task number in the Manual (e.g., Task #, etc.).

i) It is the best in terms of your time management if you start and finish your **Lab Report** in the same day or soon after you do the experiment, while your memory is fresh and you are on top of the material. Delaying writing the **Lab Report** till the due date is likely to result in taking more of your time.

1.5.2. Submitting your Lab Report

a) Reports are due exactly **one (1) week** after completion of the experiment. The collection of reports will be specified by the course instructor. For example, the students may be required to submit them on Canvas by a certain time exactly one week after conducting the experiment.

b) **All late reports must be emailed directly to the TAs** who will record the time and date of submission. Late submission will result in reduced marks (10%/day). Lab reports submitted more than **three days** (including holidays) after the due date **will be accepted with zero (0) mark.**

c) The following page is an example of the cover/title page of your reports.

This is an example for the cover page

ELEC 344

Lab Experiment #

Section L

Bench #:

Partners	Student ID #:	% participation	Signatures
T. Edison			
M. Faraday			

Date Performed: October 5, 2022

Date Submitted: October 12, 2022