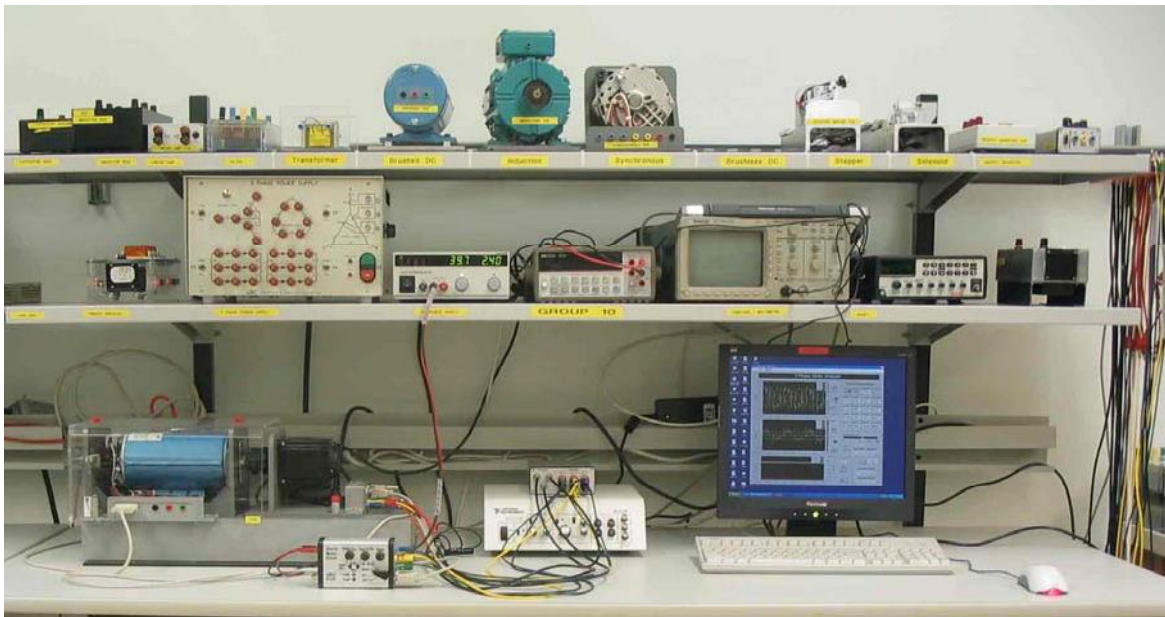




The University of British Columbia
Department of Electrical and Computer Engineering

Electromechanical Devices Laboratory Room MCLD 130



Content for undergraduate courses: EECE 365, 373, 374 and 376:

General Information and Laboratory Rules

Lab-1: AC/DC Circuits and Basic Measurements

Lab-2: Linear Solenoid Actuator

Lab-3: AC Transformers

Lab-4: Permanent Magnet Stepper Motor

Lab-5: Permanent Magnet Brushed DC Motors

Lab-6: AC Squirrel-Cage Induction Motors and VFDs

Lab-7: Synchronous Machine –Car Alternator

Lab-8: Permanent Magnet Synchronous Machine - Brushless DC Motors

Version 3: Revised on January 2014

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 Technician 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**.
- d) Your safety is of the most importance. 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 Technician 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**.
- 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) In the case of accident, immediately notify the TA and/or Technician responsible for the lab, your fellow students/partners, and seek immediate appropriate medical help. In the case of emergency call 911.
- l) **No food and/or beverages** are allowed in the laboratory at any time.
- m) 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.