Issue Date or Doc #	Safe Work Practice (SWP)	
ENG-SAF-SWP-001.00	**Batteries**	
Authoring Dept:	A battery is an energy storage medium. It stores electrical energy by means of an electrochemical process. It could be used for a variety of applications ranging from electric vehicles to portable electronic devices such as laptops, e-scooters, etc. This SWP focuses on common batteries, such as disposable and lithium ion, used in day-to-day activities or for those where battery usage is a peripheral component of a task. It is recognized that while this information may be useful in battery research, it may not be adequate or applicable.	
Faculty of Engineering		

This SWP must be reviewed and understood before proceeding. This document is meant to supplement other information including but not limited to training, hazard and risk assessments, procedures, standards, and manufacturer information. The manufacturer's instructions should be reviewed before using equipment and followed. Do not proceed unless you have received training on equipment use, reviewed manufacturer instructions, and have been approved to proceed by an authorized person or group. Follow standard housekeeping and pre-use inspection practices.

REPORT ANY DEFECTS OR DEFICIENCIES IMMEDIATELY TO YOUR SUPERVISOR.

1. Potential Hazards and Personal Protective Equipment (PPE) Requirements

- Chemical hazards: Venting/Leakage. Disposable gloves and safety goggles should be worn to protect the skin and eyes against escaped fluids from the battery.
- Mechanical hazards: Mechanical hazard occurs if the battery is dropped, cut into, or distorted from mechanical force applied on the battery. This force could result in flying objects or internal faults, which may lead to serious injuries. Safety protection including boots (standard green triangle is recommended for heavy batteries), gloves (cut-resistant or disposable), and eye protection should be worn to protect from such hazards when moving large batteries or many batteries.
- Electrical hazards: Hazards under this category includes electric shock, short-circuiting leading to overheating or fire hazards. Safety gloves and goggles should be worn to protect from electric shock. Untrained persons should not handle batteries above 50 VDC (Volts Direct Current).
- Fire Hazards: Overheating and fire explosions are potential battery hazards in this category.

NOTE:

- PPE is not usually required for most day-to-day battery use, but it is recommended when handling damaged or large batteries.
- Risks and control should be assessed based on circumstances of use in certain academic settings.

COMMON HAZARDS						
						
Flammable	**Corrosive Material**	**Hot Surface**	**Electric Shock**	**Weight Dropping**		

RECOMMENDED PPE						
						
Eye Protection	**Gloves**	**Foot Protection**	**Other Body Protection**	**Face Shield**		
Task Dependent	Task Dependent	Task Dependent	Task Dependent	Task Dependent		

2. Pre-Operational Safety Items

- READ and follow the instructions on the manual, if available.
- Do a visual check, keeping an eye out for dents, swelling, holes, leakage on the terminals, other signs of damage or wear. Wear appropriate PPE to handle damaged batteries and place in appropriate secondary container for disposal.
- Battery should be clean before usage. Terminals can be cleaned with a clean cloth of alcohol swabs, wear necessary PPE and be careful not to touch the terminals with your hands. Battery must be fully dry before use.
- Make sure to align the positive, (+) on the battery with the positive on the battery compartment in the device.
- It is recommended that battery temperature is at room temperature at the start of operating the battery. Temperatures may increase during operation; hence a temperature check is advised during usage.
- Do not modify or attempt to repair your battery. Do NOT cut, crush, or drop the battery.
- Use the correct charger i.e., the one that came with the device, and do not attempt to recharge disposable batteries.
- Make sure your charger is certified, identified by a recognized Canadian certification mark, such as CSA, cUL or cETL.

3. Operational Safety Items

- Do not charge your device on your bed/couch/under your pillows, or in damp or wet locations.
- Do not leave your device hanging during charging. Place on a surface e.g., a side table.
- Do not overcharge your device.
- Do not use/leave batteries or device under direct sunlight, exposed to heat, in extremely cold environment, near corrosive or flammable material.
- Ensure battery size is appropriate before installed in your device.
- Check for any exposure of battery terminals from the battery compartment.

4. Post-Operational Safety Items

- Disconnect chargers after use. Do not leave it plugged in.
- Put battery away, do not cover if hot and could cause a burn.
- Remove battery from devices before repairs, assembly, cleaning, adjustments, and storage (if used infrequently).
- When not in use, it is recommended to cover the terminals of your battery with insulating materials such as electrical tape.
- Keep batteries away from metal objects like keys, to prevent creating an unintended short circuit.
- Store battery in a cool, dry place away from direct sunlight and flammable/conductive materials. Special storage solutions such as dedicated flammable cabinets may be recommended for large volumes of batteries.
- Dispose of batteries using battery recycling bins or by dropping off to a hazardous waste drop-off. Do NOT dispose in garbage cans or regular recycling.