

## Basic Electrical Safety

**General:** electricity has become an essential part of life both at home and work. As a source of power, electricity is accepted without much thought to the hazards encountered. However, for 1984, the Bureau of Labor Statistics reported, of 3,740 work-related deaths that occurred, 10 percent of the fatalities (approximately 270 deaths) were the direct result of electrocutions.

**Electrical Extension Cords:** electrical extension cords are an acceptable means of providing temporary electrical power, however they cannot be used as a substitute for permanent electrical installation.

- When using extension cords observe the following guidelines:
- Make sure the electrical extension cords are UL or Factory Mutual listed, three-wire grounded cords, Do not use two wire ungrounded cords in a laboratory setting.
- Make sure that the entire length of cord is visible and protected from damage. Take the time to inspect the cord on an occasional basis and report any noted damage or defects to the instructor immediately.
- Do not run cords through walls, doors, under rugs or across aisles. Also, do not wrap cords around electrical fixtures, lights, ventilation ducts or pipes.
- Do not attempt to repair cords with black tape or wire nuts. Rather, replace the damaged cord with a new one.

**Ground-Fault Circuit Interrupters (GFCI):** a GFCI is a fast-acting, electrical circuit interrupting device that is sensitive to very low levels of current flowing to ground. The GFCI is designed to sense leaks of current near 5 ma. The unit operates only on line-to-ground fault currents, such as insulation leakage currents or currents likely to flow during accidental contact with a "hot" wire of a 120V circuit to ground.

GFCI's should be used when working in highly conductive or easily grounded work environments, e.g., outdoor locations, garages, wet locations, metal surfaces, etc. The device should be tested in accordance with the manufacturer's recommendations to insure proper working order.

**Lockout/Tagout:** the unexpected starting of electrical equipment by automatic or manual means may cause injuries from electrical shock or from mechanical, chemical or thermal radiation energies. When electrical equipment must be repaired or modified, employees must take steps to secure the controlling mechanism or switch in the OFF position. When these work conditions exist, a written Lockout/Tagout Program must be developed and all affected employees must be properly trained in the requirements of the Program.

### Things to Remember:

- Don't get in over your head.
- If a circuit breaker trips more than once call the Facilities & Services Routing Office (333-0340) and report the problem.
- Make sure that electrical equipment and tools are maintained in good condition, free from defects that could injure you.



## References:

American National Standards Institute: C2-1993. National Electrical Safety Code. Published by the Institute of Electrical and Electronics Engineers, Inc. New York

Greenwald, G. A., ed. Illustrated Guide to Electrical Safety. (Contact the American Society of Safety Engineers at 847-699-2929)

National Fire Protection Association: Standard #70E. Electrical Safety Requirements for Employee Workplaces. Quincy, MA. 1995

Schram, Peter J., ed. National Fire Protection Association Standard # 70 National Electric Code Handbook. Quincy, MA. 1996

United States Department of Labor. Control of Hazardous Energy (Lockout-Tagout). OSHA Publication 3120. Washington: GPO, 1988

United States Department of Labor. Controlling Electrical Hazards. OSHA Publication 3075. Washington: GPO, 1988

Additional information about electrical safety can be obtained from the Section at (217) 244-7212 or e-mail to [jwilkers@uiuc.edu](mailto:jwilkers@uiuc.edu).

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