

ECE 435 LABORATORY SAFETY CONSIDERATIONS

Fall 2002

This document addresses safety considerations for students participating in the ECE 435 laboratory. Students should review all safety material provided by previous lab supervisors and be aware of the health effects of electrical shock. This document describes specific potential hazards for ECE 435.

Electrical Shock

Any time students use electrical equipment there is a possibility of electrical shock. In the ECE 435 lab there is little potential for shock since most equipment produces low-voltage, high-frequency signals. However, there are several experiments which use equipment with potentially exposed electrical connections. By using caution and common sense, a high level of electrical safety can be maintained.

The HP-200CD (medium voltage AC), the 715A Klystron power supply (high voltage AC), and the IMPATT diode power supply (low voltage DC) have electrical terminals into which banana-plug cables are inserted. This equipment is used in the introductory microwave and cavity perturbation experiments. Any possibility of electrical shock can be avoided if the students **completely assemble the circuit before turning on electrical power**. In any event, students should **never touch** the metal banana plug contacts when the cables are inserted into the equipment.

Whenever using electrical equipment of any kind, students should be on watch for frayed and broken plugs, wires, and connections. Any potential hazards should be **immediately reported to the lab instructor**.

Microwave Exposure

Several ECE 435 experiments involve using signals at microwave frequencies. Power levels employed are well below those which give rise to electromagnetic heating. However, the subtle physiological effects of microwave energy are still uncertain, and students should take care to minimize their exposure to microwave energy. The following guidelines should be sufficient to provide a safe environment.

1. Never look directly into the open end of a waveguide or transmission line.
2. Never radiate EM fields in the direction of yourself or other people.
3. Never perform measurements while anyone is inside the anechoic chamber.

Note that the measurement software has been written so that RF output is turned off at all times when measurements are not being performed. However, students must be aware of the presence of persons inside the anechoic chamber, and make sure that the measurement process is not initiated when the chamber is occupied.

If students have ANY questions regarding safety, they should immediately discuss them with their lab instructor.