



BME 211 Circuit Analysis Laboratory

Week#1 Introduction and Safety



Introduction



- This manual is prepared for an Electrical Circuits Laboratory Course which is taken simultaneously with a Circuit Analysis Course.
- The manual starts with the guidelines to be followed in the laboratory continuous with the introductory safety instructions
- Lab covers the topics ranging from basic resistive circuits, Ohm's and Kirchhoff's Laws, superposition theorem, power calculations and maximum power transfer, Thevenin's Theorem, operational amplifiers, inductors and capacitors, first and second order circuits and frequency selective circuits.



Laboratory Guidelines



The content can be summarized as:

- Introduction to the class, safety guidelines
- 10 experiments, written midterm, experimental final
- Preliminary works
- Quiz
- Short summary by the assistant
- Procedure
- Report



Laboratory Safety

Safety is crucial in both our daily life and in laboratory work.

We are responsible for creating safe working environment for you in the laboratory and you yourself are responsible for your own safety by following and maintaining safety precautions.

Help ensure your safety when working around electricity and electronic devices by learning to:

- Recognize and avoid potential dangers.
- Pay attention to all warnings and cautions.
- Follow good personal and laboratory safety habits.



Laboratory Safety Advices



- Never hurry. Work deliberately and carefully.
- Use appropriate safety equipment when required to do so.
- Check over all tools and equipment before using them. Report any defects or problems to your instructor.
- Connect to the power source LAST.
- If you are working with a lab kit that has internal power supplies, **turn the main power switch OFF** before you begin work on the circuits. Wait a few seconds for power supply capacitors to discharge. These steps will also help prevent damage to circuits.



Laboratory Safety Advices (Cont.)



- If you are working with a circuit that will be connected to an external power supply, **turn the power switch of the external supply OFF** before you begin to work on the circuit.
- Check the power supply voltages for proper value and for type (DC, AC, frequency) before connecting it to your circuit.
- Do not run wires over moving/rotating equipment, or on the floor, and do not string them across walkways from bench-to-bench.
- Remove conductive watch bands or chains, finger rings, wrist watches, etc., and do not use metallic pencils, metal or metal edge rulers, etc. when working with exposed circuits.



Laboratory Safety Advices (Cont.)



- When using large electrolytic capacitors be sure to wait long enough (approximately five time constants) for the capacitors to discharge before working on the circuit.
- All conducting surfaces intended to be at ground potential should be connected together.
- In case there is a smoke or over-heating on your circuit, or you think there is something wrong in your experimental setup (laboratory equipments, circuit elements on your board, etc.), ask help from your instructors. Do not touch any device on your circuit or on your desk.