EL 111 DC Fundamentals

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Goals

This is the first in-depth technical course in the student's major. It provides the foundation of device and network fundamentals which is the basis of all technical courses that follow. The student will be able to calculate and measure currents, voltages, resistances and power dissipations in series, parallel and series-parallel combinations of resistive, capacitive and inductive circuits with DC current and/or voltage sources applied; use theorems and techniques to solve complex circuits; analyze effects upon circuit parameters when component values are changed. The laboratory part of this course will provide the exposure to laboratory instruments which will serve the student throughout his/her career.

Equipment

- Agilent 34401A Digital Multimeter (DMM)
- Agilent E3631A Triple output DC power supply
- A milliammeter or equivalent Handheld MM, such as Agilent 971A
- Various resistors, potentiometers, and tungsten pilot lamp
- PSpice circuit simulation tool (project only)

Experiments

- Syllabus: EL 111 DC Fundamentals
- Laboratory Project: EL 111 DC Fundamentals
- Experiment 1: Resistor Color Code and Use of the Ohmmeter
- Experiment 2: Ohm's Law Relationships
- Experiment 3: Effect of Temperature on Resistance
- Experiment 4: Series Circuits
- Experiment 5: Voltage Divider Rule for Series Circuits
- Experiment 6: Parallel Circuits
- Experiment 7: Volt-Amp Characteristics
- Experiment 8: Series-Parallel Circuits
- Experiment 9: Kirchhoff's Voltage Law, Subscripted Voltages
- Experiment 10: Superposition
- Experiment 11: Thevenin's Theorem
- Experiment 12: Norton's Theorem
- Experiment 13: Maximum Power Transfer Theorem
- Experiment 14: Time Constants-Series RC Circuit with DC Applied