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| **Subject** | Electrical Circuits I | **Course Code** | CT113 | **Theoretical** | 4 hrs / wk |
| **Semester** | 1 | **Prerequisite** | None | **Practical** | 0 hrs / wk |

| **Program Learning Components** | | |
|---|---|---|
| **Week 1-2** | **1. Voltage, Current and Resistance:** | **Resources** |
| | • Explain Metric system and Electrical units.<br>• Use of Scientific notations and metric prefixes.<br>• Discuss charge, current, voltage and resistance.<br>• Ohm's law and basic calculations.<br>• Explain Power formulas, power supply and voltage drops. | Projector.<br>Simulation using HE© software package. |
| **Week 3** | **2. Series Circuits:** | **Resources** |
| | • Determine total series resistance.<br>• Ohm's law in series circuits.<br>• Adding voltage sources in series.<br>• Apply Kirchhoff's voltage law.<br>• Determine Power in series circuits.<br>• Using voltage dividers. | Projector.<br>Multisimsoftware package. |
| **Week 4** | **3. Parallel Circuits** | **Resources** |
| | • Identify parallel circuit.<br>• Determine total parallel resistance.<br>• Apply Ohm's law in parallel circuits.<br>• Adding current sources in parallel.<br>• Apply Kirchhoff's current law.<br>• Using current dividers.<br>• Determine Power in parallel circuits. | Projector.<br>Multisimsoftware package. |
| **Week 5** | **4. Series-Parallel Combination Circuits** | **Resources** |
| | • Identifying and analyzing the circuits.<br>• Simplifying ladder networks.<br>• Convert voltage source to current source.<br>• Convert current source to voltage source | Projector. |

| Week | 5. Circuit Analysis Methods | Resources |
|---|---|---|
| 6-7 | • Explain Mesh Analysis (General Approach).<br>• Undertake First-Midterm Test.<br>• Explain Nodal Analysis (General Approach). | Projector.<br>Multisimpackage. |
| Week 8-10 | **6. Network Theorems** | **Resources** |
| | • Explain and apply superposition theorem.<br>• Explain and apply The venin's theorem.<br>• Explain and apply Norton's theorem.<br>• Explain maximum power transfer theorem. | Projector.<br>Multisimpackage. |
| Week 11-12 | **7. Capacitance** | **Resources** |
| | • Explain the capacitor and type of capacitors.<br>• Determining series and parallel connections.<br>• Charging and discharging of capacitors and current and voltage relationship.<br>• Undertake Second-Midterm Test. | Projector.<br>Multisimpackage. |

**Course Assessment:**

| Course Work | Mid-Term Tests | Final Examination |
|---|---|---|
| 10 | 30 | 60 |

**NOTE: Course Work may include assignments, projects and practical activities.**