**CSE 103L: Circuits & Systems-I Lab**

**Credit Hours: 1**

**Contact Hours: 3**

**Grading: As per UET Statutes**

1. **Course Outline:**

This lab is focused on getting students comfortable in the use of electrical laboratory equipment, e.g. ohm-meter, ammeter, voltmeter, signal generators and oscilloscope, while knowing their limitations and the use of breadboard for circuit building and testing. The use of computer simulation package SPICE for analyzing passive DC and AC circuits will also be an integral part of lab sessions.

1. **Weekly Plan:**

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| **Lab** | **Experiments** |
| Lab 01 | Introduction to electrical lab equipments . |
| Lab 02 | Finding resistance of unknown resistor by color coding method and DMM |
| Lab 03 | Verification of Ohm’s Law using PSPICE Simulation. |
| Lab 04 | Verification of Ohm’s Law on breadboard using DMM. |
| Lab 05 | Verification of Kirchoff Voltage Law (KVL) using breadboard |
| Lab 06 | Verification of Kirchoff Current Law (KCL) using PSPICE |
| Lab 07 | Complex Circuit Analysis using PSPICE. |
| Lab 08 | Complex Circuit Analysis using breadboard. |
| Lab 09 | Verification of Node Voltage Method. |
| Lab 10 | Verification of Mesh Current Analysis |
| Lab 11 | Verification of Thevenin’s Theorm. |
| Lab 12 | Verification of Norton’s Theorem. |
| Lab 13 | Circuit Analysis using MATLAB |
| Lab 14 | Analyzing First RC Transient Circuit. |
| Lab 15 | Analyzing First RL Transient Circuit. |
| Lab 16 | Analyzing First RLC Transient Circuit. |

1. **CLOs and its Mapping with PLOs**

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| **CLO #** | **CLO** | **Domain** | **PLOs** |
| CLO-1 | Demonstrate the functionality of basic electrical tools by designing and implementing analog circuits and systems using electronics’ software and hardware tools such as ohm-meter, ammeter, voltmeter, PSPICE. | P4 (Mechanism) | PLO 5 (Modern Tool Usage) |
| CLO-2 | Conduct experiments related to basic laws and theorems of circuits and systems and analyze them on breadboard and PSPICE. | P4 (Mechanism) | PLO 2 (Problem Analysis) |
| CLO-3 | Design circuits and systems projects that yield real life solutions in the form of project groups. | P7 (Organization) | PLO 3 (Design/ Development of Solutions) |

1. **CLOs Assessment Mechanism**

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| **Assessment Tools** | **CLO1** | **CLO2** | **CLO3** |
| Lab Reports and Performance | 100% | 50% |  |
| Final Term |  | 50% |  |
| Semester Project |  |  | 100% |

1. **Resources**
   * TEXT BOOKS
     + Electric Circuits, by Theodore F. Bogart, Jr.
   * REFERENCE BOOKS
     + Principles of Electric Circuits by Floyd
   * SOFTWARE TOOLS
     + PSPICE and MATLAB
2. **Grading Criteria**

* Lab Reports 🡪 15%
* Lab Performance 🡪 15%
* Final Term Examination 🡪40%
* Project + Viva 🡪 30%