

**Dhaka International University**  
Department of Computer Science and Engineering

<b>Course Code:</b> 0533-102	<b>Course Title:</b> Physics Lab
<b>Course Type (Core Course/Electives/ GED):</b> Basic Science	
<b>Year /Semester:</b> 1 <sup>st</sup> Semester	<b>Academic Session:</b>
<b>Course Teacher:</b> Md. Rakib Hossain	<b>Credit Value:</b> 1
<b>Contact Hours:</b> 2 hours	<b>Total Marks:</b> 50

**Rationale:** To exercise Physics laboratory- specially obtaining the characteristics of DC circuits including Series parallel circuits, characteristics of ohms' law, the basic circuit theorems and their applications to design and maintain such circuits.

**Course Objectives:**

The objectives of this course are

1. to access and use the most basic functions of electrical test and measurement equipment including oscilloscopes, multimeters, function generators and power supplies.
2. to analyze complex circuits using KCL and KVL.
3. to simplify circuit analysis using various circuit theorems.
4. to enable the students to build circuits and conduct experiments on it in a laboratory setting.
5. Record and document results of lab work using text and graphs.

**Course Content:**

**Electricity:** Different electrical units, Coulomb's law, Electric field, Electric potential, Gauss's law and its applications, Electric dipole, Electric field in dielectric media, Ohm's law and Kirchhoff's law with applications, AC voltage applied to circuits containing passive elements, Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Reciprocity theorem, Millman's theorem, Substitution theorem, Analysis of series and parallel AC and DC networks.

**Magnetism:** Faradays and Lenz's law of electromagnetic induction, Self and Mutual induction, Biot-Savart law, Magnetic force on change in current, Ampere's law, Alternating voltage and current with their graphical representation, RMS value of a current and voltages, Introduction to transformers.

**Course Learning Outcomes (CLOs):** At the end of this course, students will be able to-

1. Apply theoretical knowledge in performing the lab measurements & develop skills in using electrical measuring devices.
2. Analyze series and parallel circuits.
3. Apply and execute different network theorem in circuit.
4. Perform of group works to solve the circuit related problems.

**Mapping of CLOs with Program Learning Outcomes (PLOs):**

CLOs	PLOs	Bloom's Taxonomy (Domain/Level)	Delivery Method & Activities	Assessment Strategy
CLO-1	PLO-A	Cognitive/ Apply,	Lab class, tools	Lab Work, Lab Report
CLO-2	PLO-B	Cognitive/ Create,	Lab class	Lab Work, Lab Report
CLO3	PLO-E	Cognitive/ Apply, Psychomotor/ Manipulation	Lab Class, Software and hardware tools	Lab work, Lab Report
CLO4	PLO-F	Cognitive/ Apply, Psychomotor/ Manipulation	Lab Class	Lab work

Mapping of Course – PO – K – EP/EA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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**Mapping Course Learning Outcomes (CLOs) with the Teaching-Learning and Assessment Strategy:**

Week	Topic	Teaching Learning Strategy	Assessment Strategy	Corresponding CLOs
1.	Familiarization of different equipment involved with Electrical Circuit Lab.	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Discussion</li></ul>	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Lab reports</li><li>● Viva</li></ul>	CLO-1
2.	Analyze linearity curve of Ohm's law.	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Discussion</li></ul>	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Lab reports</li><li>● Viva</li></ul>	CLO-2
3.	Verification of KCL and Current Divider Rule for DC circuits.	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Discussion</li></ul>	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Lab reports</li><li>● Viva</li></ul>	CLO-3 CLO-4
4.	Verification of KVL and Voltage Divider Rule for DC circuits.	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Discussion</li></ul>	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Lab reports</li><li>● Viva</li></ul>	CLO-3 CLO-4
5.	Analysis of series and parallel circuits.	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Discussion</li><li>● Group work</li></ul>	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Lab reports</li><li>● Viva</li></ul>	CLO-1 CLO-2
6.	Verification of Superposition theorem.	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Discussion</li></ul>	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Lab reports</li><li>● Viva</li></ul>	CLO-3 CLO-4
7.	Verification of Thevenin's theorem.	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Discussion</li></ul>	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Lab reports</li><li>● Viva</li></ul>	CLO-3 CLO-4
8.	Verification of Norton's theorem.	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Discussion</li></ul>	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Lab reports</li><li>● Viva</li></ul>	CLO-3 CLO-4
9.	Verification of Maximum power transfer theorem.	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Discussion</li></ul>	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Lab reports</li><li>● Viva</li></ul>	CLO-3 CLO-4
10.	Project work	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Discussion</li><li>● Group work</li></ul>	<ul style="list-style-type: none"><li>● Demonstration</li><li>● Lab reports</li><li>● Viva</li></ul>	CLO-4

**References:**

1. Introductory Circuit Analysis - Robert L. Boylestad; Publisher: Prentice Hall; 12 Edition (January 15, 2010).

2. Electrical Technology - B.L. Theraja; Publisher: Chand (S.) & Co Ltd, India (July 21, 2008).
3. Electronic Devices and Circuit Theory - Robert L. Boylestad, Louis Nashelsky; Publisher: Prentice Hall; 10 Edition (July 31, 2008).
4. Engineering Circuit Analysis - William Hayt, Jack Kemmerly, Steven Durbin; Publisher: McGraw-Hill Science/Engineering/Math; 7 Edition (February 20, 2007).