## BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

| Course Code | 20ES1251 | Year | I | Semester | II |
|---|---|---|---|---|---|
| Course Category | Engineering Science | Branch | ME | Course Type | Lab |
| Credits | 1.5 | L-T-P | 0-0-3 | Prerequisites | Nil |
| Continuous Internal Evaluation | 15 | Semester End Evaluation | 35 | Total Marks | 50 |

**Course Outcomes:** Upon successful completion of the course, the student will be able to

| CO | Statement | Skill | BTL | Expt. No |
|---|---|---|---|---|
| CO1 | **Apply** techniques/procedures of Electrical & Electronics Engineering to solve problems. | Apply | L3 | 1-14 |
| CO2 | Conduct experiments as a team / individual by using equipment available in the laboratory. | Apply | L3 | 1-14 |
| CO3 | **Examine** the network theorems and Kirchhoff's laws for DC electrical circuits. | Analyze | L4 | 1-3,12 |
| CO4 | **Analyse** the open circuit characteristic of DC shunt generator and efficiency of single phase transformer. | Analyze | L4 | 6-10 |
| CO5 | **Analyse** the characteristics/ performance parameters of Electronic and Analog Circuits. | Analyze | L4 | 6-9,13 |
| CO6 | make an effective report based on experiments | Analyze | L4 | 1-14 |

**Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3: High, 2: Medium, 1: Low)**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | | | 3 | | | | | | | | | | 1 |
| CO2 | | | | 3 | 3 | | | | 3 | | | | 1 | 1 |
| CO3 | | 3 | | 3 | | | | | | | | | 1 | 1 |
| CO4 | | 3 | | 3 | | | | | | | | | 1 | 1 |
| CO5 | | 3 | | 3 | | | | | | | | | 1 | 1 |
| CO6 | | | | 3 | | | | | | 3 | | | 1 | 1 |

| Expt. No. | Contents | Mapped CO's |
|---|---|---|
| | Conduct any ten experiments | |
| 1 | Verification of Kirchhoff's Laws KVL and KCL. | CO1, CO2, CO3, CO6 |
| 2 | Verification of DC Superposition Theorem. | CO1, CO2, CO3, CO6 |
| 3 | Verification of Thevenin's Theorem and Norton's Theorem. | CO1, CO2, CO3, CO6 |
| 4 | Open circuit characteristics/magnetization characteristics of DC shunt generator. | CO1, CO2, CO4, CO6 |
| 5 | OC and SC Tests on single phase transformer. | CO1, CO2, CO4, CO6 |
| 6 | Voltage Current Characteristics of a p-n Junction Diode. | CO1, CO2, CO5, CO6 |
| 7 | Half wave rectifier with and without filter. | CO1, CO2, CO5,CO6 |

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|---|---|---|
| 8 | Full wave rectifier with and without filter. | CO1,CO2, CO5,CO6 |
| 9 | Voltage Regulation with Zener Diode. | CO1,CO2, CO5,CO6 |
| 10 | Inverting and Non-inverting Amplifier Design with Op-amp. | CO1,CO2, CO5,CO6 |
| 11 | Verification of KCL and KVL using PSPICE. | CO1,CO2, CO3,CO6 |
| 12 | Verification of Network Theorems using PSPICE. | CO1,CO2, CO3,CO6 |
| 13 | Diode and Transistor Circuit Analysis using PSPICE. | CO1,CO2, CO5,CO6 |
| 14 | Inverting and Non-inverting Amplifier Design with Op-ampusing PSPICE. | CO1,CO2, CO5,CO6 |

**Learning Resources**

**Text Books**

1. D.P.Kothari, I.J.Nagrath, Basic Electrical and Electronics Engineering, 1st Edition, McGraw Hill Education (India) Private Limited, 2017.
2. B.L.Theraja, Fundamentals of Electrical Engineering and Electronics, 1st Edition, S.Chand Publishing, New Delhi, 2006.
3. Millman Jacob, Halkias C Christos, Electronic Devices and Circuits, 2nd Edition, Tata Mcgrawhill Publications, 2007.

**Reference Books**

1. S.K. Bhattacharya, Basic Electrical and Electronics Engineering, Pearson Education, 2011.
2. Dharma Raj Cheruku, B T Krishna, Electronic Devices and Circuits, 2nd Edition, Pearson Education, 2008.
3. R.K.Rajput, Basic Electrical and Electronics Engineering, University Science Press, New Delhi, 2012.

**e- Resources & other digital material**

1. http://202.53.81.118/course/view.php?id=122
2. https://nptel.ac.in/courses/108105112/