

**Department of Electrical and Electronics Engineering**

**Lesson Plan**

**Name of the Subject** : BASIC ELECTRICAL AND ELECTRONICS  
ENGINEERING (14BT30234)

**Class & Semester** : B.Tech. II Year-I Semester (Mechanical Engineering)

**Name of the faculty Member** : Mr. B. Subba Reddy

| S. No.  | Topic   | No. of periods | Book(s) followed | Topics for self study                                      |
|---|---|----------------|------------------|--|
| <b>UNIT – I: BASICS OF ELECTRICAL ENGINEERING</b> |   |                |                  |  |
| 1.  | Sources of Electricity and basic circuit components, Electric field, Electric current | 1              | T1 & T2          | learn and analyze different circuits and their parameters. |
| 2.  | Potential and potential difference, EMF, electric power, Ohm's law                    | 1              | T1 & T2          |  |
| 3.  | Node, path, loop, branch, Resistive, inductive and capacitive networks                | 1              | T1 & T2          |  |
| 4.  | Kirchhoff's laws  | 1              | T1 & T2          |  |
| 5.  | Series-parallel circuits  | 1              | T1 & T2          |  |
| 6.  | Mesh analysis   | 1              | T1 & T2          |  |
| 7.  | Nodal analysis  | 1              | T1 & T2          |  |
| 8.  | Star-delta and delta-star transformation  | 1              | T1 & T2          |  |
| 9.  | Problems  | 1              | T1 & T2          |  |
| 10.   | Formative test 1  |                | T1 & T2          |  |
| <b>Total periods required:</b>                    |   | <b>09</b>      |                  |  |
| <b>UNIT – II: AC FUNDAMENTALS</b>                 |   |                |                  |  |
| 11.   | Production of alternating voltage   | 1              | T1 & T2          | analyze the response of AC circuits.                       |
| 12.   | Phase and phase difference  | 1              | T1 & T2          |  |
| 13.   | Phasor representation of alternating quantities                                       | 1              | T1 & T2          |  |
| 14.   | Behavior of AC series circuits  | 1              | T1 & T2          |  |
| 15.   | Behavior of AC parallel circuits  | 1              | T1 & T2          |  |
| 16.   | Behavior of AC series parallel circuits   | 1              | T1 & T2          |  |
| 17.   | Power factor, power in AC circuit   | 2              | T1 & T2          |  |
| 18.   | Problems  | 1              | T1 & T2          |  |
| 19.   | Formative test 2  |                |                  |  |
| <b>Total periods required:</b>                    |   | <b>09</b>      |                  |  |
| <b>UNIT -III: DC AND AC MACHINES</b>              |   |                |                  |  |
| 20.   | Construction and working of a DC Generator  | 1              | T1 & R1          | analyze the behavior of different types of machines.       |
| 21.   | EMF equation of a generator   | 1              | T1 & R1          |  |
| 22.   | Working of a DC motor, Torque equation of a DC motor                                  | 1              | T1 & R1          |  |
| 23.   | Types of generators and motors, Applications of DC generators and DC motors           | 1              | T1 & R1          |  |

| S. No.   | Topic   | No. of periods | Book(s) followed | Topics for self study   |
|--|---|----------------|------------------|---|
| 24.  | Problems  | 1              | T1 & R1          |   |
| 25.  | Construction and working of a single phase transformer                        | 1              | T1 & R1          |   |
| 26.  | EMF equation of a single phase transformer                                    | 1              | T1 & R1          |   |
| 27.  | Construction and working of a three phase induction motor                     | 1              | T1 & R1          |   |
| 28.  | Applications of three phase induction motors                                  | 1              | T1 & R1          |   |
| 29.  | Problems  | 1              | T1 & R1          |   |
| 30.  | Formative test 3  |                |                  |   |
| <b>Total periods required:</b>                                       |   | <b>10</b>      |                  |   |
| <b>UNIT – IV: ELECTRICAL AND ELECTRONIC MEASURING INSTRUMENTS</b>    |   |                |                  |   |
| 31.  | PMMC-construction-working principle   | 1              | T1 & R1          | analyze working and applications of electrical and electronics measuring instruments. |
| 32.  | PMMC torque equation and applications   | 1              | T1 & R1          |   |
| 33.  | Repulsion type moving iron instrument construction, working                   | 1              | T1 & R1          |   |
| 34.  | Attraction type moving iron instrument construction, working                  | 1              | T1 & R1          |   |
| 35.  | MI instrument torque equation and applications                                | 1              | T1 & R1          |   |
| 36.  | Dynamometer type wattmeter-construction-working principle                     | 1              | T1 & R1          |   |
| 37.  | Rectifier type voltmeter and ammeter  | 1              | T1 & R1          |   |
| 38.  | Digital voltmeters, Digital multi-meters                                      | 1              | T1 & R1          |   |
| 39.  | Formative test  |                |                  |   |
| <b>Total periods required:</b>                                       |   | <b>09</b>      |                  |   |
| <b>UNIT – V: RECTIFIER CIRCUITS AND BIPOLAR JUNCTION TRANSISTORS</b> |   |                |                  |   |
| 40.  | Half wave rectifier, peak inverse voltage, ripple factor, voltage and current | 1              | T1 & R3          | design appropriate amplifier for given transistor configuration.                      |
| 41.  | Full wave rectifier, peak inverse voltage, ripple factor, voltage and current | 1              | T1 & R3          |   |
| 42.  | Efficiency and regulation.  | 1              | T1 & R3          |   |
| 43.  | Formation of PNP / NPN junctions  | 1              | T1 & R3          |   |
| 44.  | Transistor as an amplifier, Need for biasing                                  | 1              | T1 & R3          |   |
| 45.  | Single stage amplifier, Frequency response of CE amplifier                    | 1              | T1 & R3          |   |
| 46.  | Necessary conditions for oscillators, RC phase shift oscillator               | 1              | T1 & R3          |   |
| 47.  | Crystal oscillator  | 1              | T1 & R3          |   |
| 48.  | Formative Test 5  |                | T1 & R3          |   |
| <b>Total periods required:</b>                                       |   | <b>08</b>      |                  |   |
| <b>Grand total periods required:</b>                                 |   | <b>45</b>      |                  |   |

**TEXT BOOKS:**

- T1. V.K. Mehta and Rohit Mehta, *Principles of Electrical and Electronics Engineering*, 2<sup>nd</sup> edition, S.Chand, New Delhi, 2007.
- T2. M.S. Naidu and S. Kamakshaiyah, *Introduction to Electrical Engineering*, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2007.

**REFERENCE BOOKS:**

- R1. Theraja B.L & Theraja A.K, *A text book of electrical technology*, Vol-I, S.Chand, New Delhi, 2009.
- R2. T. K. Nagsarkar, M. S. Sukhija, *Basic Electrical Engineering*, Oxford University Press, New Delhi, 2011.
- R3. K. Lal Kishore, *Electronic Devices and Circuits*, 3<sup>rd</sup> Edition, BS Publications, Hyderabad, 2008.

