

**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. Kamakshiah, *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.

