Prasad V. Potluri Siddhartha Institute of Technology, Kanuru, Vijayawada

PVP20

Department of Freshman Engineering

Basic Electrical & Electronics Engineering

Course Code	20ES1201	**Year**	I	**Semester**	II
Course Category	Engineering Science	**Branch**	ECE	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Nil
Continuous Internal Evaluation	30	**Semester End Evaluation**	70	**Total Marks**	100

Course Outcomes

Upon successful completion of the course, the student will be able to

CO1	**Understand** the basic concepts of DC circuits, Electrical Machines, Concepts of Electronic Devices and Circuits and realize the Applications of Electrical & Electronics in Interdisciplinary Engineering Domains (L2)
CO2	**Apply** the basic knowledge of mathematics, science and electrical engineering to obtain the desired parameters of Electric circuits and Machines. (L3)
CO3	**Analyse** the behaviour of Electric circuits, transformers and Electrical machines. (L4)
CO4	**Apply** the basic principles of Electronics to solve Analog Circuits. (L3)
CO5	**Analyse** the characteristics/ performance parameters of Electronic Circuits. (L4)
CO6	Ability to **investigate** various problems in DC circuits, Electrical Machines and Electronic Devices and Circuits and **submit a report.**

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														
CO2	3												2	2
CO3		3											2	2
CO4	3												2	2
CO5		3											2	2
CO6				3					2	2			2	2

Syllabus

Unit No.	Syllabus	Mapped CO's
1	**Basic laws and Theorems-DC Circuits**: Ohms law, Kirchhoff's Laws, series and parallel resistive circuits, source transformations, delta-wye conversion. Mesh analysis, nodal analysis. Superposition theorem, Thevenin's theorem, Norton's theorem and maximum power transfer theoremwith simple examples (**independent sources only**).	CO1,CO2, CO3,CO6
2	**DC Machines**: Construction, working principle, Voltage Build up, EMF equation, Torque expression, types of excitation, types of dc machines, necessity of Starter, losses and efficiency.	CO1,CO2, CO3,CO6
3	**Transformers**: Construction, working principle, EMF equation, open and short-circuit tests, voltage regulation definition, losses and efficiency. **Three Phase Induction Motors:** Construction, working principle of three phase induction motor.	CO1,CO2, CO3,CO6
4	**Semiconductor Devices**: P-N Junction diode - Basic operating principle, current-	CO1,CO4,

	voltage characteristics, half-waverectifier, full-waverectifier,rectifiers with filter capacitor, Zener diode as Voltage Regulator.	CO5,CO6
5	**Operational Amplifiers**: The Ideal Op Amp, The Inverting Configuration-The closed loop gain, Effect of Finite open-loop gain, The Non-inverting Configuration - The closed loop gain, Characteristics of Non Inverting Configuration, Effect of finite open loop gain, The voltage follower.	CO1,CO4, 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/