

Basic Electrical & Electronics Engineering

Course Code	20ES1101	Year	I	Semester	I
Course Category	Engineering Science	Branch	CSE	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

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

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 theorem with 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-voltage characteristics, half-waverectifier, full-waverectifier, rectifiers with filter capacitor, Zener diode as Voltage Regulator.	CO1,CO4, 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
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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/>