

Detailed Syllabus
Lecture-wise Breakup

Course Code	15B11EC111	Semester - Even	Semester II Session 2018 -2019 Month from Jan to June
Course Name	Electrical Science -1		
Credits	4	Contact Hours	4

Faculty (Names)	Coordinator(s)	
	Teacher(s) (Alphabetically)	

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Basic Concepts	Voltage, Current, Power and Energy analysis for Circuit elements (R, L, C), Independent and Dependent Sources, Kirchhoff's Laws, Voltage Divider rule, Current Divider rule	6
2.	DC Circuit Analysis	Star-Delta Transformation, Source transformation, Mesh and Supermesh Analysis, Nodal and super nodal Analysis	6
3.	Network Theorems	Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem	6
4.	Sinusoidal Steady State Analysis	Physical Model for a Sinusoid, Average Value, Effective Value, Phasor presentation, Addition of Phasor using Complex Numbers, Concepts of impedance and admittance.	4
5.	AC Network Analysis and Theorems	Mesh and Nodal analysis, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem	6
6.	Resonant Circuits	Series and Parallel resonance, frequency response of Series and Parallel resonance, Q-Factor, Bandwidth	4
7.	Electrical Instruments	Essentials of an Instrument, Permanent Magnet Moving Coil (PMMC) Instruments, voltmeter, ammeter, Ohmmeter, Meter Sensitivity (Ohms-Per-Volt Rating); Loading Effect; Multimeter; Cathode Ray Oscilloscope: Construction, Working and Applications. Function Generators	6
8.	Single Phase Transformer	Principle of operation, construction, e.m.f. equation, equivalent circuit, power losses, efficiency (simple numerical problems), introduction to auto transformer.	4
Total number of Lectures			42

Evaluation Criteria

Components	Maximum Marks
T1	20
T2	20
End Semester Examination	35
TA	25 (Assignment = 12, Quiz = 5, Attendance = 8)
Total	100

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	R.C. Dorf and James A. Svoboda, “Introduction to Electric Circuits”, 9 th ed, John Wiley & Sons, 2013.
2.	Charles K. Alexander (Author), Matthew N.O Sadiku, “ Fundamentals of Electric Circuits”, 6 th ed, Tata Mc Graw Hill, 2019.
3.	Robert L. Boylestad, Louis Nashelsky, “ Electronic Devices and Circuit Theory ”, 11 th ed, Prentice Hall of India, 2014.
4.	D.C. Kulshreshtha, Basic Electrical Engineering, Revised 1 st ed, Tata Mc Graw Hill, 2017 .