

First Year 1st Semester Curriculum Structure for B.Tech. Course

Basic Electrical Engineering Lab (ESC191)	
Department:	Basic Science and Humanities
Program:	B. Tech.
Course Code:	ESC191
Title of Course:	Basic Electrical Engineering Lab
Year of Study:	First Year
Semester:	First
Contact Hours:	L-T-P: 0-0-2
Credits:	1
Type of course:	Laboratory
Pre-requisites Courses:	High school physics
Course Outcome (CO):	CO1: To learn how we can connect the different elements (like resistance) series and parallel in breadboard. CO2: To learn the practical verification of the network theorem with the theoretical results CO3: Observe the speed variation of the DC motor by the resistance of the armature and field CO4: To verify the open circuit and short circuit results and got the idea about the core loss and copper loss of the single phase transformer (Note: CO must be in multiple of 4 only)

List of the Experiments

Choose any 12 experiments from the following list

Sl No	Exp No	Name of the experiments	Using Platform	Link
01	01	Design R-L-C series circuit set the input voltage 9V and resistance $R=100\Omega$. Note down the voltage and current of the circuit. Determine the power factor and impedance of the circuit.	Virtual lab	http://vlab.amrita.edu/?sub=1&brch=75&sim=330&cnt=1
02	02	Design R-L-C parallel circuit set the input voltage 6V and resistance $R=70\Omega$. Note down	Virtual lab	http://vlab.amrita.edu/?sub=1&brch=75&sim=325&cnt=1

		the voltage and current of the circuit. Determine the power factor and impedance of the circuit.		
03	03	Verification of Thevenin's Theorem in breadboard	Virtual lab	http://vlab.amrita.edu/?sub=1&brch=75&sim=313&cnt=1
04	04	Verification of Norton's Theorem in breadboard	Virtual lab	http://vlab.amrita.edu/?sub=1&brch=75&sim=312&cnt=1
05	05	Verification of Superposition Theorem in breadboard	Multisim	
06	06	Verification of Maximum power Transfer Theorem in breadboard	Multisim	
07	07	The open circuit and short circuit tests on a 1kVA, 55/220 V, 50Hz, single phase transformer. Perform open circuit and short circuit test. i) Determine the parameters of the equivalent circuit. ii) Draw the equivalent circuit refer to the LV side	Virtual lab	https://ems-iitr.vlabs.ac.in/electrical-machines-(simulation)/exp/circuit-parameters-oc-test/
08	08	a) In Speed control of DC shunt motor set the value of Armature current (I_a) 2.9A and field current (I_f) fixed. Draw the characteristics between armature voltage and speed of the motor. b) For the same experiment set the value of armature voltage (V_a) 100V and armature current (I_a) constant. Draw the characteristics between field current (I_f) and speed of the motor.	Virtual lab	https://ems-iitr.vlabs.ac.in/electrical-machines-(simulation)/exp/dcshunt-motor-armature-control/
09	09	In no load characteristics of DC shunt generator driven at 400 RPM. Vary the voltage of Field current and also note down armature voltage at each step. Draw the no load characteristics of generator	Virtual lab	https://ems-iitr.vlabs.ac.in/electrical-machines-(simulation)/exp/magnetization-characteristics-dcshunt/
10	10	a) In Speed control of DC shunt motor set the value of Armature current (I_a) 2.5A and field current (I_f) fixed. Draw the	Virtual lab	https://ems-iitr.vlabs.ac.in/electrical-machines-(simulation)/exp/dcmotor-field-resistance-control/

		characteristics between armature voltage and speed of the motor. b) For the same experiment set the value of armature voltage (V_a) 120V and armature current (I_a) constant. Draw the characteristics between field current (I_f) and speed of the motor		
11	11	Calibration of ammeter, voltmeter, wattmeter and draw the graphs.		
12	12	Measurement of 3ph. power by two wattmeter method and calculate the power factor (use star connected load) and also measure the neutral current.		
13	13	Demonstration of L.T. Switch gear... MCB, MCCB, ICDP, ICTP, CHANGE OVER SWITCH, LT BUS BAR, LT DISTRIBUTION BOX etc.		
14	14	Starting and reversing of D.O.R. of D.C. shunt motor by using 3point starter.		

o Book list:

1. Basic Electrical Engineering - Abhijit Chakrabarti, Sudipta Nath, Chandan Kumar Chanda
2. Basic Electrical Engineering (vol2) - B.L. Thereja
3. Basic Electrical engineering, D.P Kothari & I.J Nagrath, TMH, Second Edition
4. Hughes Electrical & Electronics Technology, 8/e, Hughes, Pearson Education

