

Branch Name:	Electrical Engineering
Program Code:	ET109
Course Name:	Electrical Machine-I Practical
Course Code:	2ET1090302P
Pre-requisite Course:	Elements of Electrical Engineering

Course Objectives:

1. In this subject student will learn concept regarding to DC Machines and Transformer.
2. The major objective of the subject is to understand working and performance of DC Machines and Transformer.
3. To make students aware about importance of DC Machines and Transformer, its applications in industries and Substation.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								Total (Marks)
					Theory (Marks)				Practical (Marks)				
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1	-	-	2	2	-	-	-	-	10	25	10	25	50

Course Contents:

Sr. No	Detail of Practical	Contact Hours
1	To obtain Magnetizing Characteristics, Internal & External Characteristic of Self Excited DC Shunt Generator. Also obtain the critical field resistance of the machine from magnetizing Characteristics.	04
2	To conduct direct load test on a D.C. Compound generator with a) Shunt field alone b) Cumulative and differential compounding for short and long shunt connections.	02
3	To obtain Speed-Torque characteristics of DC Series Motor and DC Shunt Motor.	02
4	To determine the efficiency of two similar shunt machines by regenerative method. (Hopkinson's Test.)	04
5	To perform field test on D.C. series motor.	02
6	To determine the various losses in a D.C. machine and separation of its core losses.	02
7	To perform direct load test on a D.C. shunt motor and plot variation of (a) Input current (b) Speed(c) Torque (d) Efficiency versus output power.	04
8	To separate hysteresis and eddy current losses of a single phase transformer at rated voltage, frequency by conducting no load tests at different frequencies keeping V/f constant.	02
9	To operate two single phase transformers of different KVA ratings in parallel and plot the variation of currents shared by each transformer versus load current.	02
10	To conduct open circuit and short circuit test on a three phase three winding transformer and determine the equivalent circuit parameters.	02
11	Speed control of DC Shunt Motor using a) Armature control and b) field control methods. Also perform Swinburne's test on DC Shunt Motor.	02

Reference Books:

1. MG Say, Theory, Performance & Design of A.C. Machines, CBS Publishers.
2. Fitzgerald A.E and Kingsley, Electrical Machinery, Tata McGraw Hill.
3. Langsdorf A S, Theory of A C Machinery, Tata McGraw Hill.
4. K. Murukesh Kumar, DC machines and Transformers, Vikas Publishing house Pvt Ltd.

List of Open Source Software/learning website:

- Circuit Lab:
- <https://www.circuitlab.com/editor/>
- Learning website
- <http://www.electrical-engineering-portal.com/>
- <http://nptel.iitm.ac.in/courses.php>

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Understand working principle, performance, control and applications of DC Machines.	2 Understanding
CLO2	Carry out test and conduct performance experiments on DC machine.	3 Applying 4 Analyze
CLO3	Identify, formulate and solve DC machine related problems.	3 Applying 5 Evaluate
CLO4	Know working principle, performance and applications of transformer.	1 Remembering
CLO5	Understand test and conduct performance experiments on transformer.	2 Understanding
CLO6	Formulate and solve transformer related problems.	3 Applying 5 Evaluate

Mapping of CLOs with POs & PSOs:

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1		L		H		M						M				L
CLO2	H				L	H		M		L			L		H	
CLO3				M			L				M		M			L
CLO4		L		H		M						M				L
CLO5				M			L				M		M			L
CLO6	H			H	L	M		M				M	L		H	L

H: High, M: Medium, L: Low