COURSE MODULES OF THE COURSE TAUGHT FOR THE ODD SESSION 2024-25

Course Syllabi with CO's

Faculty Name : **Raghavendra L**			Academic Year: 2024 - 2025				
Department: **Electrical & Electronics Engineering**							
Lab Code	Lab Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs/ Sessions
				L	T	P	
BEEL305	**Transformers and Generators Lab**	**Core**	**Basic Knowledge about Transformers and Alternators.**		**-**	**3**	**42**
Objectives	• To conduct various tests on transformers and synchronous machines and evaluate their performance. • To perform the parallel operation on two single-phase transformers. • To study and verify the performance of the synchronous generator. • To calculate the voltage regulation of an alternator using different methods for comparison.						
Experiments Covered as per Syllabus							
1	Open Circuit and Short circuit tests on single phase step up or step down transformer and predetermination of (i) Efficiency and regulation (ii) Calculation of parameters of equivalent circuit.						
2	Sumpner's test on similar transformers and determination of combined and individual transformer efficiency.						
3	Parallel operation of two dissimilar single-phase transformers of different kVA and determination of load.						
4	Polarity test and connection of 3 single-phase transformers in star–delta and determination of efficiency and regulation under balanced resistive load.						
5	Comparison of performance of 3 single-phase transformers in delta – delta and V – V (open delta) connection under load.						
6	Separation of hysteresis and eddy current losses in single-phase transformer						
7	Investigate the voltage and current ratios of a multi-tapped transformer and verify the ideal transformer ratio.						
8	Voltage regulation of an alternator by EMF and MMF methods.						
9	Power angle curve of synchronous generator or Direct load test on three phase synchronous generator to determine efficiency and regulation.						
10	Performance of synchronous generator connected to infinite bus, under constant power and variable excitation & vice - versa.						
11	Model transformer in Simscape for Automatic Voltage Regulation.						
12	Simulate power angle curve of generator in MATLAB.						

Cycle-1

Experiments: 01, 02, 03, 04, 06, 07, 11

Cycle-2

Experiments: 05, 08, 09, 10, 12

Department of Electrical and Electronics Engineering

List of Text Books	
1.Electrical Machinery by P S Bhimra 2. Electrical machines by I J Nagrath and Kothari	
List of Reference Books	
1.AC and DC machines by B L Thereja 2.Electrical Machines by U A Bhakshi and A V Bhakshi	
Course Outcomes	***At the end of the course, the student will be able to:*** CO1: **Develop** the equivalent circuit, voltage regulation, and efficiency of transformers. CO2: Conduct and simulate tests on transformers and synchronous generators to **Examine** their performance. CO3: **Identify** the performance of two single-phase transformers of different KVA ratings connected in parallel. CO4: **Examine** the voltage and current ratios of a multi-tapped transformer. CO5: **Analyze** the performance of 3 single-phase transformers connected in star-delta, delta – delta and V – V (open delta) for three-phase operation. CO6: **Solve** for the voltage regulation of an alternator using different methods. CO7: **Demonstrate** the synchronization of the synchronous generator to the infinite bus.
Internal Assessment Marks: CIE marks for the practical course is 50 Marks (Record is evaluated for 30 marks and the test is for 20 marks).	

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Lab Code:	**BEEL305**	**TITLE: Transformers and Generators Lab**					**Faculty Name:**		**Raghavendra L**		
List of Course Outcomes	**Program Outcomes**										
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO-1	3	3	1	2	-	-	-	-	2	-	-	2
CO-2	3	3	1	2	3	-	-	-	2	-	-	2
CO-3	3	3	1	2	-	-	-	-	2	-	-	2
CO-4	3	3	1	2	-	-	-	-	2	-	-	2
CO-5	3	3	1	2	-	-	-	-	2	-	-	2
CO-6	3	3	1	2	-	-	-	-	2	-	-	2
CO-7	2	3	1	2	-	-	-	-	2	-	-	2

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution "-" = No Contribution

The Correlation of Course Outcomes (CO's) and Program Specific Outcomes (PSO's)

Lab Code:	BEEL305	TITLE: Transformers and Generators Lab	Faculty Name:	Raghavendra L
List of Course Outcomes		Program Specific Outcomes		
		PSO1	PSO2	
CO-1		2	-	
CO-2		2	-	
CO-3		2	-	
CO-4		2	-	
CO-5		2	-	
CO-6		2	-	
CO-7		2	-	

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution "-" = No Contribution