DC MACHINES LABORATORY

III Semester: EEE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AEEC09	Core	0	0	3	1.5	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36				Total Classes:36		

Prerequisite: Electrical Circuits, Linear Algebra and Calculus

I. COURSE OVERVIEW:

This is the main lab where experiments like load test on various machines, speed control tests, open circuit tests, short circuit tests, etc are carried out. and also wide variety of practical experiments are performed here with combination of different rotating machines. The laboratory is also used for research activities in machines and to carry out project works on energy conversion.

II. COURSE OBJECTIVES:

The students will try to learn:

I. Conduct various tests on DC identical series and shunt machines.
II. Develop procedure for speed control of DC machines.
III. Conduct various tests on DC shunt, series and compound machines
IV. Simulate DC machine to study the characteristics by using digital simulation.

III. COURSE SYLLABUS:

Week – 1: OPEN CIRCUIT CHARACTERISTICS OF DC SHUNT GENERATOR
Magnetization characteristics of DC shunt generator

Week – 2: LOAD TEST ON DC SHUNT GENERATOR
Determination of efficiency by load test in DC shunt generator

Week – 3: LOAD TEST ON DC SERIES GENERATOR
Determination of efficiency by load test on DC series generator

Week – 4: LOAD TEST ON DC COMPOUND GENERATOR
Determination of efficiency by load test on DC compound generator

Week – 5: HOPKINSON'S TEST
Study the performance characteristics of two identical DC shunts machines

Week – 6: FIELD'S TEST
Study the performance characteristics of two identical DC series machines

Week – 7: SWINBURNE'S TEST AND SPEED CONTROL OF DC SHUNT MOTOR
Predetermine the efficiency and study the characteristics of DC shunt machine with different speed control techniques

Week – 8: BRAKE TEST ON DC COMPOUND MOTOR
Study the performance characteristics of DC compound motor

Week – 9: BRAKE TEST ON DC SHUNT MOTOR
Study the performance characteristics of DC shunt motor by brake test

Week – 10: RETARDATION TEST
Study the performance characteristics by using retardation test on DC shunt motor

Week – 11: SEPARATION OF LOSSES IN DC SHUNT MOTOR
Study the method used for separation of losses in DC shunt motor.

Week – 12: MAGNETIZATION CHARACTERISTICS OF DC SHUNT GENERATOR
Study the magnetization characteristics of DC shunt generator using digital simulation.

Week – 13: LOAD TEST ON DC SHUNT GENERATOR USING DIGITAL SIMULATION
Perform the load test on DC shunt generator using digital simulation

Week – 14: SPEED CONTROL OF DC SHUNT MOTOR USING DIGITAL SIMULATION
Verify the speed control techniques of DC motor using digital simulation

IV. REFERENCE BOOKS:

1. P S Bimbhra, "Electrical Machines", Khanna Publishers, 2nd Edition, 2008.
2. M G Say, E O Taylor, "Direct Current Machines", Longman Higher Education, 1st Edition, 1985.
3. Hughes, "Electrical Technology", Prentice Hall, 10th Edition, 2015.
4. Nesimi Ertugrul, "LabVIEW for Electric Circuits, Machines, Drives, and Laboratories", Prentice Hall, 1st Edition, 2002.
5. Gupta, Gupta & John, "Virtual Instrumentation Using LabVIEW", Tata McGraw-Hill, 1st Edition, 2005.

V. WEB REFERENCES:

1. https://www.ee.iitkgp.ac.in
2. https://www.citchennai.edu.in
3. https://www.iare.ac.in /