Course Name: Electric Machine Laboratory –II
Course Code: EE 591
Credit: 2

Prerequisites:

Sl. No.	Subject	Description	Level of Study
01	Mathematics	Co-ordinate System, Vector Calculus	Class XII, 1st Sem
02	Physics	Electrostatics, Electromagnetism	1st Sem, 2nd Sem
03	Electric Machine-I	Dc machine, Three phase Induction Machine and Three phase transformer	4th sem

Course Objective:

- To expose the students to the operation of Synchronous machines and induction motors and give them experimental skills.
- To give students practical laboratory experience with the basic of Synchronization in grid.
- To introduce students to industrial control of electric machines as well with safe electrical connection and measurement practices.

Course Outcomes:

At the end of the course, a student will be able to:

CO1. **Identify** relevant information to supplement to the Electric Machine II (EE 591) course.

CO2. **Set up** testing strategies and select proper instruments to evaluate performance characteristics of electrical machines.
Develop testing and experimental procedures on different types of electrical machines and **Analyze** their operation under different loading conditions.

CO3. **Estimate** constraints, uncertainties and risks of the system (social, environmental, business, safety issues etc.). **Combine** an understanding of the established principles, theories, concepts and terminology relevant to electrical machines with practical laboratory experimentation;

CO4. **Prepare** professional quality textual and graphical presentations of laboratory

data and computational results,incorporatingacceptеddataanalysisandsynthesismethods, mathematicalsoftware,andword-processingtools.

CO5.Primarilyviateam-basedlaboratory activities,studentswilldemonstratetheabilitytointeract effectivelyonasocialandinterpersonal levelwithfellowstudents,andwilldemonstrate the abilitytodivideupandsharetaskresponsibilitiestocompleteassignments.

CO6. Originate a professional experience on working in a power plant or any practical field and to be ready for life-long involvement in the farther improvement of relevant technology.

CO- PO mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE 591. 1	1	-	-	2	-	-	-	1	-	-	-	-
EE 591. 2	-	-	2	-	-	-	2	-	-	-	-	-
EE 591. 3	-	1	-	1	-	-	-	-	2	-	1	-
EE 591. 4	-	-	2	-	-	2	-	-	2	2	2	-
EE 591. 5	-	2	-	2	-	1	-	-	1	-	-	-
EE 591. 6	-	1	-	1	2	-	1	-	-	-	-	2

Correlation levels 1, 2 or 3 as defined above: 1: Slight (Low) 2: Moderate (Medium)3: Substantial (High) and "-" if there is no correlation.

Syllabus Indicating CO:

Module No.	Content	Relevant CO's
1	Different methods of starting of a 3 phase Cage Induction Motor & their comparison [DOL, Auto transformer &Star-Delta]	**CO1, CO2, CO3, CO4, CO5**
2	Speed control of 3 phase squirrel cage induction motor by different methods & their comparison [voltagecontrol & frequency control].	**CO1, CO2, CO3, CO4, CO5**
3	Speed control of 3 phase slip ring Induction motor by rotor resistance control.	**CO1, CO2, CO4, CO5**
4	Determination of regulation of Synchronous machine by a. Potier reactance method. b. Synchronous Impedance method.	**CO1, CO2, CO3, CO4, CO5**
5	Determination of equivalent circuit parameters of a single phase Induction motor.	**CO1, CO2, CO3, CO4, CO5**
6	Load test on single phase Induction motor to obtain the performance characteristics.	**CO1, CO2, CO3, CO4, CO5**
7	To determine the direct axis resistance [Xd] & quadrature reactance [Xq] of	**CO1, CO2,**

	a 3 phase synchronous machine byslip test.	**CO3, CO4, CO5**
8	To make connection diagram to full pitch & fractional slot winding of 18 slot squirrel cage Induction motor for6 poles & 4 pole operation.	**CO1, CO2, CO3, CO4, CO5**
9	To study the performance of Induction generator.	
10	Parallel operation of 3 phase Synchronous generators.	**CO1, CO2, CO3, CO4, CO5,CO6**
11	V-curve of Synchronous motor	