COURSE CODE: **1154EE111**	COURSE TITLE: **ELECTRICAL MACHINES**	L	T	P	C
		3	**0**	**0**	**3**

COURSE CATEGORY:

University Elective

PREAMBLE :

In this course student will get expose basic Electrical DC & AC machines concepts, and methods of speed controls, Applications as stepper & Brushless motors.

PREREQUISITE COURSES:

Basic Electrical Engineering

RELATED COURSES:

Electrical Machine Design

COURSE EDUCATIONAL OBJECTIVES:

The objectives of the course are to make the students,

- To provide knowledge on construction and operation of DC machines
- To provide Theory and operation, phasor diagram of transformer
- To understand the Concept of synchronous machines
- To understand the poly phase Induction motor principle
- To provide knowledge on single phase Induction motor principle

COURSE OUTCOMES :

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Explain the Construction and operation of DC Machines	K2
CO2	Explain the Theory and operation, phasor diagram of transformer	K2
CO3	Explain the Concept of synchronous machines	K2
CO4	Illustrate the three phase Induction motor principle	K2
CO5	Illustrate the single phase Induction motor principle	K2

CORRELATION OF COs AND POs

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			M					L	M			L
CO2	L		M	M				L	M			
CO3			M	L				L	M			
CO4				L				L			M	
CO5	M			H				L	M			

COURSE CONTENT:

UNIT I	**DC MACHINES**	**9**
Construction of DC Machines, Methods of excitation, Magnetization and operating characteristics of generators, Starters. Speed-torque characteristics of DC motors. Speed control .Losses and efficiency.		
UNIT II	**TRANSFORMERS**	**9**
Theory and operation, Phasor diagram, equivalent circuit, open and short circuit tests. Performance estimation, Auto-transformers. Parallel operation, three phase transformer Connections. Instrument transformers: CT&PT		
UNIT III	**SYNCHRONOUS MACHINES**	**9**
Alternators - types and constructional features - emf equation, Concept of synchronous reactance, regulation by EMF and MMF methods, Synchronous motor starting and V curves.		
UNIT IV	**INDUCTION MACHINES**	**9**
Poly phase Induction motors - types and constructional features - equivalent circuit - starting and speed control, circle diagram, induction generators.		
UNIT V	**SINGLE PHASE INDUCTION MACHINES**	**9**
Single phase induction motors -types and constructional features-principle of operation equivalent circuit based on double revolving field theory, Shaded pole induction motor-Linear reluctance motor-Hysteresis motor-AC series motor.		
		TOTAL: 45 PERIODS

TEXT BOOKS:

1. . Dr. P.S. Bhimbra, 'Electrical Machinery', Khanna Publications, 7th Edition, 2007.
2. Nagrath, I.J.and Kothari, D.P., 'Electrical Machines', Tata McGraw Hill Education Private Limited Publishing Company Ltd., 4th Edition, 2010.
3. M. G. Say, 'Performance and design of Alternating Current Machines', John Wiley and Sons Publications, 3rd Edition, 1983.

REFERENCE BOOKS:

1. Arthur Eugene Fitzgerald and Charles Kingsley, 'Electric Machinery', Tata McGraw Hill Education Publications, 6th Edition, 2002.
2. Vincent Del Toro, 'Electrical Engineering Fundamentals', 2nd Edition, Prentice hall Publications, 2003.
3. Parkar Smith, N.N., 'Problems in Electrical Engineering', 9th Edition, CBS Publishers and Distributers, 1984.
4. Miller, T.J.E., 'Brushless Permanent Magnet and Reluctance Motor Drives', Clarendon Press- Oxford, 1989.