Course Number and Name

BEE305 - Electrical machines

Credits and Contact Hours

3 & 45

Course Coordinator's Name

Ms Anitha Sampath Kumar

Text Books and References

Text Books:

1. Nasar S.A., " Electric Machines and Power Systems ", Vol. 1, McGraw Hill Inc., New Delhi, 1995.
2. Wadhwa C.L., " Electrical Power Systems ", Wiley eastern Ltd., India, 1985.

REFERENCE

1.www.ceecs.fau.edu

Course Description

To impart basic knowledge on electrical machines, principles and its operation

Prerequisites	Co-requisites
Basic Electrical and Electronics Engineering	Nil

required, elective, or selected elective (as per Table 5-1)

required

Course Outcomes (COs)

CO1- Outline the basics of electrical machines and analyze the characteristics of DC machines

CO2- Understand and implement speed control techniques for practical applications.

CO3- Describe the working of transformer and assess its regulation and efficiency on load and no-load .

CO4- Know the working concept of different types of induction motor and analyze the operating behavior of induction motor using its performance indices.

CO5- Explain the basics of synchronous machines and interpret performance characteristics.

CO6- To understand the power generation and Transmission systems

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k
CO1						M				H	
CO2	M		H								
CO3				H					M		
CO4	M						M				H
CO5		L									
CO6						H					

List of Topics Covered

UNIT I CIRCUITS AND TRANSFORMERS 9

Three phase circuits and transformers, Three phase balanced circuits with R-L-C loads, Power measurement in 3 Phase circuit, Two watt meter method, Principle of operation of Transformers, Equivalent circuit, Voltage regulation, Efficiency, Transformer connections.

UNIT II DC MOTORS 9

Construction, Operating principle of motor, Types, Characteristics, Starting, Speed control, Testing.

UNIT III INDUCTION MOTORS 9

Construction, Types, Principle of operation of 3 phase induction motors, Equivalent circuit, Performance calculation, Starting and Speed control.

UNIT IV SYNCHRONOUS AND SPECIAL MACHINES 9

Construction of synchronous machines, Types, Induced EMF, Voltage regulation of round rotor alternators. Brushless Alternators, Permanent magnet Synchronous machines, Reluctance machines, Hysteresis motors, Stepper motor.

UNIT V TRANSMISSION AND DISTRIBUTION 9

Structure of Electric Power systems, Generation, Transmission, Sub Transmission and Distribution systems, EHVAC and EHVDC transmission systems, Substation layout, Insulators, Cables.