Energy Conversion and Special Machines

Course Code :	**EEE 401**	**Credits :**	**03**
Exam Hours :	**03**	**Assessment :**	**30**
		Mid-term Exam :	**20**
Pre-requisite :	**None**	**Semester Final Exam:**	**50**

Course learning outcome: at the end of the Course, the Student will be able to-

CO1	Describe the working principle and solve the mathematical problems of different types of special machines.
CO2	Explain the advantages, disadvantages and applications of special machines.
CO3	Explain the fundamental principles and application of energy conversion system and analyze the basic processes in the renewable energy technology with current and future applications.
CO4	Design a solar home system for residential and commercial applications

Mapping of Course Outcomes to Program Outcomes-

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1		✓										
CO2	✓											
CO3	✓											
CO4			✓									

Week	**Topics/ content**	**Course outcome**
1	Universal motor, Repulsion motor, AC series motor	CO1
2	Reluctance and hysteresis motor	CO2
3	Electrostatic motor	CO1
4		CO2

5	Energy system, energy conversion, direct conversion to electrical energy. Solar energy and radiation, Sun-Earth geometric relationships and apparent position of the Sun.	CO3
6	Direct solar electricity conversion (Photovoltaic): Photoelectric effect, semi-conductors, p-n Junction diode, solar cells, modules and arrays.	CO4
7	Design of Solar PV systems	CO4
8	Stepper motor and control circuits (1 Phase ON & 2 Phase ON Mode)	CO1
9		CO2
10	Switch reluctance motor	CO1
11	Biomass energy	CO3
12	Wind energy	CO3
13	Geothermal energy. Direct conversion to electrical energy: Fuel cells,	CO3
14	Brushless dc motor, linear induction motor	CO2

Test Book(s):

1. K. Venkataratnam, Special Electrical Machines, Universities press (India) Private Limited.
2. B. L. Theraja and A. K. Theraja, A Text Book of Electrical Technology, Vol. 2, S. Chand & Company Ltd.
3. R. Foster, M. Ghassemi, A. Cota, Solar Energy: Renewable energy and the environment, Taylor and Francis Group.

Reference Book(s):

1. J. A. Duffie, and W. A. Beckman: Solar Engineering of Thermal Processes, Wiley-Interscience.

ASSESSMENT PATTERN

Bloom's Category Marks (Out of 100)	Quiz (20)	Assignment (10)	Mid-Term Exam (20)	Semester Final Exam (50)
Remember				
Understand	5		6	5
Apply	10	10	10	10
Analyze			4	15
Evaluate	5			
Create				20