C.U.SHAH UNIVERSITY – WADHWAN CITY

FACULTY OF: -Technology and Engineering (Diploma Engineering)
DEPARTMENT OF: -Electrical Engineering
SEMESTER: - VI **CODE**: -2TE06SEM1
NAME –Special Electrical Machines (SEM)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evalution Scheme								
							Theory				Practical (Marks)				Total Marks
							Sessional Exam		University Exam		Internal		University		
		Th	Tu	Pr	Total		Marks	Hours	Marks	Hours	Pr	TW	Pr	TW	
2TE06SEM1	Special Electrical Machine(SEM)	04	00	02	06	05	30	1.5	70	03	--	20	30	--	150

Objectives:-

- To impart Knowledge on Construction, Principle of Operation and Performance of Synchronous Reluctance Motors, Stepping Motors, Switched Reluctance Motors, Permanent Magnet B.L.D.C. Motors, Permanent Magnet Synchronous Motors and Special Transformers.

Prerequisites: -

- Basic Knowledge of AC and DC Machines.

Course Outlines:-

Sr. No.	Course Contents	No of Hours
1	**Stepping Motors** Constructional Features, Principle of Operation, Variable Reluctance Motor, Hybrid Motor, Single and Multi-Stack Configurations, Theory of Torque Predictions, Linear and Non-Linear Analysis, Characteristics, Drive Circuits.	10
2	**Synchronous Reluctance Motors** Constructional Features, Types, Axial and Radial Air Gap Motors, Operating Principle, Reluctance, Phasor Diagram, Characteristics, Vernier Motor.	11
3	**Switched Reluctance Motors** Constructional Features, Principle of Operation, Torque Prediction, Power Controllers, Non-Linear Analysis, Microprocessor Based Control, Characteristics, Computer Control.	9
4	**Permanent Magnet Brushless Dc Motors** Principle Of Operation, Its Types, Magnetic Circuit Analysis, Emf and Torque Equations, Power Controllers, Motor Characteristics And Control.	12
5	**Permanent Magnet Synchronous Motors** Principle of Operation , Emf and Torque Equations , Reactance , Phasor Diagram , Power Controllers, Converter, Volt-Ampere Requirements, Torque Speed Characteristics, Microprocessor Based Control.	10

List of Experiments:-

- To Study about Different Types of Stepper Motor.
- Perform Various Methods Speed Control of Stepper Motor.
- Dismantle/Assemble/Test a Stepper Motor and Its Types.
- To Study about Switch Reluctance Motor.
- Dismantle/Assemble/Test a Switched Reluctance Motor.
- To Study about a Hysteresis Motor.
- Dismantle/Assemble/Test a Hysteresis Motor.
- To Study about a Brushless DC Motor.
- Dismantle/Assemble/Test a Brushless DC Motor.
- To Study about Permanent Magnet Synchronous Motor.
- To Study and Dismantle/Assemble/Test A Welding Transformer / Audio Transformers
- To Study about Instrument Transformer.
- Prepare Visit Report on Transformer Manufacturer Company.
- Prepare Visit Report on Special Electrical Machine Industry.

Learning Outcomes:-

- Application and Importance of Stepper Motor.
- Calculation of Different Losses and Efficiency Of Machines
- Knowledge of Different Electrical Machine.
- Knowledge of Protective Equipment's and Safety Norms
- To Understand and Implementation of Special Electrical Machine.

Books Recommended:-

- Electrical Technology by **J.B.Gupta** ,S.K.Katariya and Sons
- A Text Book of Electrical Technology by **B.L.Theraja and A.K.Theraja**, S.Chand & Company Ltd.
- A Hand Book of Electrical Engineering, by **S.L.Bhatiya**, Khanna Publication
- A Text Book of Electric Machines by **B. R. Gupta, Vandana Singhal** "New Age International Publishers.