

## **EE8005 SPECIAL ELECTRICAL MACHINES**

### DETAILED SYLLABUS

#### **OBJECTIVES:**

To impart knowledge on the following Topics

- Construction, principle of operation, control and performance of stepping motors.
- Construction, principle of operation, control and performance of switched reluctance motors.
- Construction, principle of operation, control and performance of permanent magnet brushless D.C. motors.
- Construction, principle of operation and performance of permanent magnet synchronous motors.
- Construction, principle of operation and performance of other special Machines.

#### **UNIT I STEPPER MOTORS**

Constructional features –Principle of operation –Types – Torque predictions – Linear Analysis – Characteristics – Drive circuits – Closed loop control – Concept of lead angle - Applications.

#### **UNIT II SWITCHED RELUCTANCE MOTORS (SRM)**

Constructional features –Principle of operation- Torque prediction–Characteristics Steady state performance prediction – Analytical Method – Power controllers – Control of SRM drive- Sensor less operation of SRM – Applications.

#### **UNIT III PERMANENT MAGNET BRUSHLESS D.C. MOTORS**

Fundamentals of Permanent Magnets- Types- Principle of operation- Magnetic circuit analysis- EMF and Torque equations- Power Converter Circuits and their controllers - Characteristics and control- Applications.

#### **UNIT IV PERMANENT MAGNET SYNCHRONOUS MOTORS (PMSM)**

Constructional features -Principle of operation – EMF and Torque equations - Sine wave motor with practical windings - Phasor diagram - Power controllers – performance characteristics - Digital controllers – Applications.

#### **UNIT V OTHER SPECIAL MACHINES**

Constructional features – Principle of operation and Characteristics of Hysteresis motor- Synchronous Reluctance Motor–Linear Induction Motor-Repulsion motor- Applications.

#### TEXT BOOKS:

1. K.Venkataratnam, 'Special Electrical Machines', Universities Press (India) Private Limited, 2008.
2. T. Kenjo, 'Stepping Motors and Their Microprocessor Controls', Clarendon Press London, 1984

Diploma, Anna Univ UG & PG Courses

*Notes*  
*Syllabus*  
*Question Papers*  
*Results and Many more...*

Available @

[www.AllAbtEngg.com](http://www.AllAbtEngg.com)

3. E.G. Janardanan, 'Special electrical machines', PHI learning Private Limited, Delhi, 2014.

### **REFERENCES**

1. R.Krishnan, 'Switched Reluctance Motor Drives – Modeling, Simulation, Analysis, Design and Application', CRC Press, New York, 2001.
2. T. Kenjo and S. Nagamori, 'Permanent Magnet and Brushless DC Motors', Clarendon Press, London, 1988.
3. T.J.E.Miller, 'Brushless Permanent-Magnet and Reluctance Motor Drives', Oxford University Press, 1989.
4. R.Srinivasan, 'Special Electrical Machines', Lakshmi Publications, 2013.