

EE529: SPECIAL ELECTRICAL MACHINES (3-0-0: 3)

Stepper Motor

Introduction, Types, Hybrid stepper motor- construction, principle of operation, two phases energized at a time, conditions for operation, different configurations, VR Stepper motor- single stack and multi stack, Drive systems and circuit for open loop and Closed loop control of stepping motor, Dynamic characteristics, Single phase stepper Motor, Expression of voltage, current and torque for stepper motor and criteria for synchronization.

Switched Reluctance Motor

Constructional features, principle of operation, Design Aspects and profile of the SRM, Torque equation, Power converters and rotor sensing mechanism, expression of torque and torque-speed characteristics.

Brushless DC Motor

Construction, operation, sensing and switching logic scheme, Drive and power circuit, Theoretical analysis and performance prediction, transient Analysis.

Servo motors

Types of servomotors, construction, operating principle and application.

Linear Induction Motor

Construction and principle of operation of Linear Induction Motor, Approximate calculation of the force on rotor.

Text Books and References

1. K. Venkataratnam, "Special Electrical Machines", University Press.
2. A. E. Fitzgerald, Charles Kingsley, Stephen D. Umans, "Electrical Machinery", McGraw Hill.
3. T. J. E Miller, "Brushless Permanent Magnet and Reluctance Motor Drives", Clarendon Press, Oxford.
4. T. Kenjo and S. Nagamori, "Permanent Magnet and Brushless DC Motors", Clarendon Press, Oxford.
5. T. Kenjo, "Stepping Motors and their Microprocessor Control", Clarendon Press, Oxford.
6. R. Krishnan, "Switched Reluctance Motor Drives, Modelling, Simulation, Analysis, Design and applications", CRC press.