PSPE205 AC and DC DRIVES

Module-I

12hrs

Introduction to motor drives: Components of power electronic Drives- Criteria for selection of Drive components-match between the motor and the load- Thermal consideration- match between the motor and the power electronics converter- characteristics of mechanical systems- stability criteria.

DC Motor Drives: System model, motor rating, motor-mechanism dynamics-Drive transfer function.

Module- II

14hrs

Phase controlled D C Motor Drives- Steady state analysis of the 3-phase converter controlled DC motors Drive , Steady state solution including Harmonics, Discontinuous current conduction, Transfer functions of the sub systems, two quadrant dc motor drive with field weakening. Four quadrant dc motor drive. Chopper- Controlled DC motor drive: Four quadrant chopper circuit, chopper for inversion. Model of the chopper, steady state analysis of chopper- controlled dc motor drive – continuous and discontinuous conduction operation, closed-loop operation.

Module-III

12hrs

Induction motor drives: Torque speed characteristics of 3-phase induction motor drive, speed control of 3-phase induction motor by varying stator frequency and voltage – impact of non sinusoidal excitation on induction motors- variable frequency converter classifications – variable frequency PWM-VSI drives- variable frequency square wave VSI drives- variable frequency CSI drives- comparison of variable frequency drives- Line frequency variable voltage drives- soft start of induction motors – speed control by static slip power recovery, static Cramer and Scherbius drives.

Text / Reference

- 1. Ned Mohan etial : Power Electronics , John wiley and sous
- 2. R.Krishnan :Electric Motor Drives PHI publication
- 3. B K Bose : Modern Power Electronics and AC drives, Pearson Education (Asia)
- 4. P C Sen : Power Electronics TMH Publication
- 5. Dubey : Power Electronics Drives- Wiley Eastern 6.