

IAC - 113
Electric Drives

(02 credits – 50 marks)

Course Outcomes:

On completion of the course, students should be able to-

1	State starting and braking of Drives
2	Observe Speed-torque characteristics of Drives
3	Demonstrate Chopper, Inverter, Cycloconverter and PWM based Control
4	Select drive for specific application
5	Categorize speed controlling of Motors

Course Contents:

Module– I: Introduction to Electrical Drives

(06 Hrs)

Electrical Drives, Advantages Of Electrical Drives, Parts Of Electrical Drives, Choice Of Electrical Drives, Status Of DC And AC Drives, Types Of Loads, Quadrantal Diagram Of Speed-Torque Characteristics, Starting and Braking of Electric Drives

Module– II: Control of Electrical Drives

(06 Hrs)

Control of electric Drives: Modes of operation. Closed-loop control of drives. Current-limit control. Closed-loop torque, and speed control. Speed and current sensing. Phase-locked-loop control.

Module– III: DC Drive

(06 Hrs)

DC Drive: Single phase half wave and full wave converter Drive, Three phase half wave and full wave converter Drive , Chopper fed DC Drive: Motoring Control, Two –quadrant Chopper Drives

Module– IV: AC Drive

(06 Hrs)

AC Drive : Inverter fed drive, single phase and three phase cycloconverters Operations in different modes and configurations, Stator voltage control, stator frequency control, Stator Current control, PWM based control

Module- V:

Presentations, case studies, Assignments, Tutorials based on Module I to IV.

Ref. Books :

1. Bimal.K. Bose, "Power Electronics and Variable frequency drives", Standard Publishers Distributors, New Delhi, 2000
2. Murphy J.M.D, Turnbull, F.G, "Thyristor control of AC motor, Pergamon press, Oxford, 1988.
3. M. H. Rashid, "Power Electronics -Circuits, Devices and Applications", P.H.I Private Ltd. New Delhi, Second Edition, 1994
4. N Mohan et al "Power Electronics-Converters, Applications and Design", John Wiley & Sons (Asia) Private Ltd., Singapore, 1996
5. Bimal K Bose, " Modern Power Electronics and AC Drives" PHI
6. R. Krishnan, "Electric motor drives: modeling, analysis and control, Pearson
7. Dubey G.K. "Power Semiconductor controlled drives", Prentice Hall inc, A division of Simon and Schester England cliffs, New Jersey 1989.
8. Sheperal, Wand Hully, L.N. "Power Electronic and Motor control" Cambridge University Press Cambridge 1987
9. Dewan,S. Slemon B., Straughen,A. G.R., "Power Semiconductor drives", John Wiley and Sons, NewYork 1984.
10. Dr. P.S. Bhimbra, "Power Electronics", Khanna Publishers, 2012