TEXT BOOK:

1. John G. Proakis and Dimitris G.Manolakis, “Digital Signal Processing – Principles, Algorithms & Applications”, Fourth Edition, Pearson Education, Prentice Hall, 2007.

REFERENCES:

1. Emmanuel C.Ifeachor, and Barrie.W.Jervis, “Digital Signal Processing”, Second Edition, Pearson Education, Prentice Hall, 2002.
2. Sanjit K. Mitra, “Digital Signal Processing – A Computer Based Approach”, Third Edition, Tata Mc Graw Hill, 2007.
3. A.V.Oppenheim, R.W. Schafer and J.R. Buck, Discrete-Time Signal Processing, 8th Indian Reprint, Pearson, 2004.
4. Andreas Antoniou, “Digital Signal Processing”, Tata McGraw Hill, 2006.

III Year	I-Semester	L	T	P	To	C
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MT331 ELECTRICAL MACHINES AND DRIVES LAB

Course Description & Objectives:

This course familiarizes the students with the means & methods to control the performance parameters of electrical motors.

Course Outcomes:

After completing the course, the student should be able to describe the fundamental parts of electrical drives including converter, electrical machine and load. explain the operating principles of induction machines, synchronous machines and dc machines identify parameters in models of electrical machines use equivalent circuits to analyze electrical machines in steady state construct phasor diagrams for different loads and to use the vector method for analysis of ac machines describe the design of a simple three-phase ac winding and explain the concepts of pole number and winding factor explain the background to voltage harmonics and estimate their influence on e.g. losses in electrical machines use dynamic simulation software to analyze vector control of induction motors.

LIST OF EXPERIMENTS:

1. Analyze steady state performance of DC machines and use relevant equations
   a) Equivalent circuits
   b) Characteristics of machines
   c) Separately-excited
   d) Shunt
   e) Series

2. Determine the transient performance of DC machines
   a) With armature inductance
   b) Without armature inductance

3. Investigate universal DC machines (ac series commutator)

4. Assess the operation of DC machines with a chopper and with field weakening

5. Investigate DC wound field and permanent magnet excitation

6. Analyse the construction, operation and control of brushless DC machines

7. Assess steady state performance of induction machines and use relevant
   a) Equations
   b) Equivalent circuits
   c) Phasor diagrams

8. Understand the characteristics and constructional features of cage-rotor induction machines in
   a) Three-phase form
   b) Single-phase form (including capacitor-fed auxiliary winding configuration)

9. Determine torque/speed relationship of induction machines
   a) Fixed supply
   b) Variable voltage supply