EE 560

Prof. Nicholas Nagel

Electric Machines and Drives

Course Syllabus

Lec	***Date***	***Topic***	***Assignment***
1	10/3	Course Overview, Background Material, Physics of DC Machines – Theory of Operation	Software tools review
2	10/10	Dynamics of DC Machines – Modeling, Root Locus Methods, Introduction to AC Machines	Hand out HW #1
3	10/17	Induction Machine Per Phase Equivalent Circuit, Speed-Torque Curve of Induction Machines, Per Unit Representation, V/Hz Control of Induction Machines, Coupled Circuit Modeling of AC Machines, Winding Functions, AC Machine Inductance Calculations	Hand in HW #1, Hand out HW #2
4	10/24	Space Harmonics in AC Machines, Flux Linkages in 3ϕ Machines, Modeling of 3ϕ Machines	Hand in HW #2
5	10/31	Midterm Exam	
6	11/7	Complex Vector Modeling of AC Machines, Coordinate Transformations, dq Modeling of AC Machines, dq Equivalent Circuits, Block Diagrams of AC Machines, Power Flow in 3ϕ Machines, Torque Production in 3ϕ Machines	Hand out HW#3
7	11/14	Physical Interpretation of Torque Production in 3ϕ Machines, dq Theory Applied to Salient Pole Machines, Torque Production in Salient Pole Machines, Extension of dq Theory Applied to PM Machines, Introduction to Field Orientation	Hand in HW #3 Hand out HW#4 Hand out Final Project
8	11/21	Steady State and Dynamic Field Orientation of Induction Machines, Direct FOC, Indirect FOC, Current Regulation in DC Machines, Speed Control, Current Regulation in AC Machines	Hand in HW #4
9	11/28	Brushless DC (BLDC) Machines, Direct Torque Control, Fundamentals of Inverters for Machine Control	
10	12/5	Review of Pulse Width Modulation Techniques, Course Review Final Project Submittal	
11	12/12	Final Exam	Turn in Final Project