

## EE 522 Electrical Drives (2)

### COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Lab.	
EE 323 EE422	5	9 or 10	2	2	-	3

### COURSE AIM

To investigate the different aspects of electrical design. To study the dynamics of the electrical drive systems. To study the applications of the electrical drives.

### COURSE WEEKLY CONTENTS

- 1 Elements of electric drive systems
- 2 Different mechanical loads characteristics: pumps, fans, compressors, crane hoists, and winches
- 3 Drive control technique applied for traction
- 4 Temperature rise and cooling of electrical machines
- 5 Load cycle and Choice of electrical motors suitable for load demand
- 6 Space phasor concept and transformation between reference frames
- 7 D-Q model of AC machines + Midterm Exam
- 8 Vector control of three-phase induction motor
- 9 Speed control of AC motors based on D-Q model
- 10 Direct torque control of Induction motor (DTC)
- 11 A comparison between voltage fed and current fed VSD
- 12 Introduction to design of electric machines
- 13 Material selection and factors affecting the machine design
- 14 Stator design of three-phase induction motors
- 15 Rotor design of three-phase induction motors

### STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	20 Midterm	←	10	MARKS		→	30
To be freely distributed among possible assessments							
8 to 12	←		20	MARKS		→	20
13 to 15	←		10	MARKS		→	10
16 or 17	40 Final						40
Total	Exams	Assign.	Quizzes	Reports	Present.	Lab.	100

### REFERENCES

Textbook	Ion Boldea and Syed A. Nasar, "Electric Drives", CRC Taylor & Francis, 2005.
Other	D.W. Novotny and T. A. Lipo, "Vector control and Dynamics of AC drives", Oxford, 1996 Ned Mohan, "Electric Drives: An Integrative Approach", MNPERE, 2004.