

## Electric Machines and Drives Project Instructions:

**PROJECT DUE DATE: 11/28/11**

The purpose of the Electric Machines and Drives course is to provide the student with the basic theory and applications of electric machines such as motors and generators and the controllers that control machine parameters. The purpose of the project for this course is to provide the student with the opportunity to learn more about one specific topic in Electric Machines and drives. The range of projects to select is very broad and not limited by those suggested below.

The format of the project will be a Power point presentation. This report shall be at least 6 slides in length including notes page. Optionally, if desired, 10 minutes will be allowed for in class presentation. (Presentation is not mandatory). While working in groups is allowed, each student shall submit a report for their research efforts.

Some possible project considerations are listed below. The student is encouraged to select from the list below or from a subject outside the ones listed below.

### **Possible subjects for student project;**

1. Describe the special applications concerns and controls needed for a common load such as a chipper that has two motors connected to chipper. Discuss options to ensure motors are matched in torque requirements and accelerating time. Discuss control strategy to ensure successful start and operation.
2. Describe a control strategy to maintain inlet damper closed on a fan application until motor reaches full speed. Discuss difference in accelerating time and overload settings for motor start with damper open vs. damper closed. Discuss difference between using damper on discharge verses damper on inlet.
3. Discuss linear motor design and operation. Discuss what is unique to linear motors verses standard induction motors. Discuss application of linear motor.
4. Discuss electric motor application to electric cars. Discuss energy conversion process. Describe both motoring and regeneration operation.
5. Discuss application of variable frequency drive to AC motor application. Discuss constant torque vs. variable torque, vs. constant HP operations.
6. Describe various methods of reduced voltage starting. Discuss applications where RVS methods may provide benefit to application. Describe any drawbacks or challenges to RVS.
7. Describe stepper motor controls and difference between stepping mode and slew mode. Describe control system for stepper motor control.