

Gulf Coast Community College
Technology Division
Computer Integrated Manufacturing (CIM)

SYLLABUS

January 2011

EST-2511C Motor and Motion Control

Instructor: Dean Eavey
850-769-1551 ext 4868 deavey@gulfcoast.edu

COURSE DESCRIPTION:

EST 2511C Electro-Mechanical & Motor Controls

Prerequisite EST 2542C Programmable Logic Controllers. This course provides experiences with electro-mechanical devices such as relays, timers, counters, proximity sensors, photo sensors, and solid state relays for control applications. Motors and motor control circuits using motor starters and variable frequency drives (VFDs) controlled by programmable logic controllers (PLCs) are developed for various control applications. Motion control is developed using Allen-Bradley servo drives

COURSE GOALS:

The goal of this course is for the student to develop expertise in Motor Controls, both Electro-Mechanical controls and Programmable Logic Controllers. The course is divided into 6 parts.

- Part 1: Electro-Mechanical Controls
- Part 2: Three Phase Power
- Part 3: Motors and Motor Starter Circuits
- Part 4: Variable Frequency Drives

SCHEDULE:

This is a 4 credit hour course and meets for 3 hours two days or nights per week for 15 weeks. The class will be about 50% class work and 50% lab work

TEXT BOOKS AND REFERENCES:

Electric Motors and Control Systems by Frank D Petruzella
ISBN10 0073521825 ISBN13: 9780073521824

Power Flex Adjustable Frequency AC Drive Users manual
[Download from www.AB.com](http://www.AB.com)



TESTS/QUIZES, GRADES, AND GRADE SCALE:

There will be a quiz over individual labs and a test over Part 1, 2, 4, and 4.

Grades based on - Lab Assignments = 50%, Tests & Quizzes = 50%

Grade Scale: 90 - 100 = A 80-89 = B 70-79 = C 60-69 = D, 0-59=F

LAB ASSIGNMENTS:

Each part has several labs. Each lab must be demonstrated to the instructor. For each lab assignment there will be a test reading assignment, a PowerPoint presentation, and a hands on lab assignment. If taking this class ON-LINE/ON-SITE with the Motor Control Trainer, labs are demonstrated through E-Mail, Video, or live web cam.

Part 1: Electro-Mechanical Controls

- LAB E1: Electrical Safety & Organizations
- LAB E2: Relay Control – Start stop Rung
- LAB E3: Relay Control – Timers
- LAB E4: Relay Control – Counters
- LAB E5: Relay Control – Latching Relays
- LAB E6: Relay Control – Solid State Relays
- LAB E7: Relay Control – Photo Sensors
- LAB E8: Relay Control – Proximity Sensors
- LAB E9: More Sensors and Switches

Part 2: Three Phase Power

- LAB T1: Measuring 3-Phase Power
- LAB T2: Transformers
- LAB T3: 3-Phase Motor Wiring

Part 3: Motors and Motor Starter Circuits

- LAB M1: Motor Starters and Overloads
- LAB M2: Motor Starters – Forward Control
- LAB M3: Motor Starters – Forward and Reversing Control
- LAB M4: Motor Starters – PLC Control
- LAB M5: Motor Starters – Control Circuits
- LAB M6: Motor Starters – Control Electronics
- LAB M7: Motor Starters – Types of Motors

Part 4: Variable Frequency Drives

- LAB V1: VFD Wiring
- LAB V2: VFD Stat-Up
- LAB V3: Pendant Programming
- LAB V4: Drive Light Programming
- LAB V5: Switch Control of the VFD
- LAB V6: PLC 4-20ma Speed Control
- LAB V7: RSVIEW32 Display and Speed Control of the VFD