

EGM 4045 – ELECTRO-MECHANICAL DEVICES
Common Course Syllabus

Catalog Data: 3 CREDITS. Principles of electrical circuits, DC and AC devices, electrical machines and sizing of electrical systems for mechanical loads. Design of circuits and filters for data acquisition. Introduction to applied electrical specification of motors and NEC codes.

Goals: This course is designed to introduce the students to concepts: 1) RLC networks and their response to step and sinusoidal inputs; 2) Selection and control of appropriate electric drive, DC or AC, for particular applications; 3) Use of basic components for signal conditioning, amplification and filtering.

Prerequisites:

1. Engineering Mathematics I – MAP 3305 or Differential Equations I – MAP 2302
2. Physics for Engineers II – PHY 2044

Topics:

1. Characteristic of resistance, inductance and capacitance components.
2. Serial and parallel connections of components.
3. Analysis of networks using Kirchhoff laws.
4. Fundamental of electric drives.
5. AC and DC motors, speed versus torque characteristic of AC and DC motors.
6. Time and frequency response of networks.
7. Characteristics of electronic components: transistors, diodes, OP amps etc.

Course Outcome: (numbers in parentheses indicate correlation of the outcome with the appropriate ABET program outcomes 1-7)

1. Students will be able to solve a resistive network with multiple sources. (1,2)
2. Students will be able to solve transient response of RL, RC and RLC networks. (1,2)
3. Students will be able to understand frequency response and its applications. (1,2)
4. Students will have a basic understanding of AC and DC motors. (1,2)

Design Content:

This course has no formal design projects. However, lab sessions will provide students with hands on experience and demonstrate some of the above concepts.

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