

**ELEI 209**  
**AUTOMATIC CONTROL FEEDBACK SYSTEMS**  
**4 Semester Hours**

**The Community College of Baltimore County**

**Description**

Automatic Control Feedback Systems

Integrates concepts into the design and understanding of a complete control system and discusses automatic control systems emphasizing positive and negative feedback; explores the use of magnetic and operational amplifiers in automatic control systems, and gain and control circuit stability.

Pre-requisites: ELEI 206, MATH 108, or consent of the instructor

**Overall Course Objectives.**

Upon completion of this course the student will be able to:

Demonstrate through written and oral presentations, a basic understanding of the operation and applications of modern control and feedback systems. Demonstrate a working knowledge, through a laboratory setting, of the theory of modern control and feedback systems as it is actually applied to industrial control problems.

**Major Topics**

Basic control and feedback concepts, symbols, block diagrams, flow diagrams. The concept of gain, summing junction concept, deriving the equations  $C/R=1/H$ , investigate the implications of  $C/R=1/H$ . Operational amplifier uses, summing references, differentiate references, integrate references. Basics of op-amps, negative feedback, op-amp sending procedures, op-amp power supply requirements. Additional op-amp circuits, clamp circuits, suicide circuits, forcing circuits, lag circuits, lag lead circuits, lead lag circuits. Transfer functions as applicable to the op-amp circuits. Constructing a motor regulator, construct current regulating loop, size reference resistors, size feedback resistors, determine integrating ramp, size clamps, calibrate the loop. Construct a speed regulator loop to act as a second stage. Develop test procedures for the two stage regulator, static test, setting gains for troubleshooting, initiating a step function, use of a recorder to establish response. Elementary concepts of stability, basic concepts of Bode diagrams.

**Course Requirements**

The instructor will administer exams (70%), written assignments (30%).

**Other Course Information**

**Additional information about this course or any other Industrial electricity/electronics course may be obtained by contacting the IEE/Telecommunications program director.**