

**Course Title: Feedback Control System****Course Code: EEA 171****Course Background / Summary:**

This short course is devised for engineers to refresh their knowledge in control theory. Basic theories and definitions are introduced before aspects of modeling can be understood. Analysis and design of control systems based on time and frequency response will assist control engineers in deciding on the control platform. Before embarking on the controller, the stability of the system should be determined to ensure the control objective is achieved. For a complex system, we are bound to a multi-input and multi-output system, and this will also be introduced in the course. With the advent of computer technology either in the software or hardware, today's engineering analysis will not be without CAD, as a control engineer MATLAB package is the answer, and it is a must for complex analysis and systems.

**Course Objectives:**

- Construct PID controller from scratch.
- Control speed, position, and level system.
- Write C code control PID algorithm to control such application.

**Target Audience:**

- Electricians, Researcher, Academicians
- Technicians, Engineers, Instructors

**Course Duration: 3 Days****Course Contents****1.0 Introduction: Definition, Open Loop and Closed Loop, Servo Control and Process Control****2.0 Modeling: Laplace Transform, Transfer Function, Pole and zero, Mechanical system, Electrical System, Electro-Mechanical System, System Identification****3.0 MATLAB: Basic Commands, Plot, Symbolic Analysis, Simulink****4.0 Time Response: First Order System, Second Order System, Transient Response, Steady State Response, Design using Root Locus, Stability****5.0 Frequency Response: Bode Plot, Nyquist Plot, Gain Margin and Phase Margin Determination of Transfer Function**