SEMESTER	***DEPARTMENT***	***COURSE TITLE***
Fifth	*Control Engineering*	*Control Theory I Lab.*
COURSE CODE	***HOURS*** 3	***COURSE SPECIFICATIONS***
EC506	***UNITS*** 1	*Practical Content*

1. ***The Fundamental Components of the Control System:***
   - Introduction to control valves, electric motors, sensors and transducers.
   - Linear time-invariant systems and representation.
   - Performance of open loop control system: Liquid- level control system.
2. ***Control System Analysis:***
   - Step response of open-loop control system.
   - Response analysis of open- loop control system: (time delay, gain, and settling time).
   - Open loop step response analysis for DC motor control.
3. ***Closed Loop Systems:***
   - Closed loop position control system design.
   - Effect of Feedback on disturbance & Control System Design.
4. ***PID Controller:***
   - Description of characteristics of the P-controller, PI-controller, and PID-controller.
   - The effect of P controller and PI controller on different closed loop systems:
     - Temperature system.
     - DC motor control system.
     - Liquid- level control system.
   - The effect of adding D controller.
5. ***Application of a PID Controller:***
   - Response requirements.
   - The parameters of the PID controller to meet the response.
   - Building PID controller using analogue and digital electronic.

References:

1. ***Modern Control Engineering***, K. Ogatta, Prentice Hall, 1994.
2. ***Modern Control Systems***, R. C. Dorf, Eddison Wesley, 1990.