



## EE461-Introduction to Control Systems and Instrumentation (Required Course)

**Code and Name:** EE461 Introduction to Control Systems and Instrumentation

**Lab Credit Hours:** 1 (Practical:2)

**Textbook:**

- Lab manual Given by University.

**Other References:**

- LabView 2009 Student Edition, RH Bishop, Prentice Hall, 2009
- Gary Johnson, Richard Jennings, LabVIEW Graphical Programming, McGraw Hill Professional, 2006
- John Essick, Labview for Scientists and engineers, Oxford university press

**Course Description:**

This lab provides an introduction to LabVIEW, tutorials and programming aspect from control systems viewpoint. Student will learn Block Diagram Reduction, performance characteristics of first and second order systems, effect of feedback, building a VI and modifying signals in Labview, use The NI USB-6009 for data acquisition and Digital Input / Output

**Pre-requisites:** EE461

**Co-requisites:** None

**Course Learning Outcomes:**

With relation to ABET Student Outcomes (SOs: 1-7)

1. Apply Mathematical and scientific principles to apply for control systems and Labview experiments. (1)
2. Labview Software Operation. (6)
3. Put results as graphs. (3)
4. Labview is a Simulation of real time system. (6)
5. Solve practical problem of circuits using theoretical concepts of engineering. (1)
6. Lab procedure. (6)
7. Apply theoretical concepts of Control Systems as PD PI and PID applications. (1)

**Topics to be covered:**

- Introduction to LabVIEW
- Building a VI and modifying signals
- Exercises in LabVIEW
- Data Acquisition
- Digital Input / Output Effect of Feedback on disturbance & Control System Design
- Using Labview to Measure Temperature with a Thermistor
- Closed loop control with Labview and a DC motor.
- Construction of an open loop Block diagram
- Construction of closed loop Block diagram
- PID control

**Grading Policy: check**

The grading for the course are 60% coursework and 40% Final Exam. The coursework consists of one Midterm Exam, where the midterm exam is worth 20%. It also includes quizzes and lab reports for the remaining 40% that is modified by the course instructor.

