COURSE	Name	: Data Acquisition and Signal Processing
	Code	: EE184642
	Credits	: 3
	Semester	: VI

Description of Course

The course of Data Acquisition and Signal Processing discusses transducer characteristics, signal conditioning system, Isolation Circuits, Analog Filter Circuits, Digital to Analog signal conversion system (DAC), and Analog to Digital (ADC) signal conversion system. It discusses the concept of Digital Signal Processing from ADC results with Digital Filters for Data Acquisition System.

Learning Outcomes

Knowledge

(P02) Mastering the concepts and principles of engineering, and implementing them in the form of procedures for analysis and design in power systems, control systems, multimedia telecommunications, or electronics.

Specific Skill

(KK03) Able to describe system design for problem solving in power systems, control systems, multimedia telecommunications, or electronics by concerning technical standards, performace aspect, reliability, ease of application, and assurance of sustainability.

General Skill

(KU01)Able to apply logical, critical, systematic and innovative thinking in the context of development or implementation of science and technology that concerns and implements the value of humanities in accordance with their area of expertise.

Attitude

(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently.

(S12) Working together to be able to make the most of his/her potential.

Course Learning Outcomes

Knowledge

Mastering the concept of transducers and their characteristics, signal conditioning, digital to analog signal conversion systems (DAC), analog to digital signal conversion systems (ADC), and the concept of Digital Filters

Specific Skill

Able to analyze transducer and analog signal conditioning to convert to digital signal (ADC) and able to analyze conversion system of digtal to analog (DAC), and able to analyze signal processing along with programming.

General Skill

Able to design and realize data acquisition and signal processing system in various application fields.

Attitude

Demonstrating attitude of responsibility on work in his/her field independently concerning to Data Acquisition and Signal Processing.

Working together to be able to take full advantage of their potential concerning to Data Acquisition and Signal Processing.

Main Subjects

1. Transducer and its characteristics.
2. Signal conditioning system.
3. Isolation Circuit, and Analog Filter.
4. Flash type ADC, Counter Ramp, and Successive Approximation Register
5. DAC type Weighted Resistors and R2R Ladder.
6. Digital filter system (LPF, HPF, BPF, BSF) using matlab and z-plane method.
7. Data Acquisition and Signal Processing System.

Reference(s)

[1] Joseph J Carr, Sensor and Circuits, Prentice Hall Inc., 1993.
[2] Instrumentation Amplifier Application Guide, Charles Kitchin and Lew Counts, Analog Device, 1992.
[3] Data Acquisition Handbook, Analog Device.
[4] Data Acquisition Data Book, Nat Inst.
[5] Digital Signal Analysis, Samuel D Stearns and Don R Hush, Prentice Hall Inc, 1990.

Prerequisite(s)

EE184542 Embedded Electronic System