Mechatronics

Autumn Semester 2021 Mechanical Engineering

Seoul National University

Professor: Prof. Heui Jae Pahk (RM301-1521)

Lecture: Thu 16:00-16:50 at RM301-105

Lab: Fri 09:00-1250 at RM301-112

Abstract:

This course is to provide the fundamental techniques for mechatronics and application such as: analog electronics circuit, digital electronics circuit, micro-processor, software programming, and mechatronics applications to practical system. This course begins with analog circuit design technique such as DC circuit, Resistors, Capacitors, RC circuits, Filters, Diode Circuit, Transistors, and Operational Amplifiers. Digital electronics and microprocessor system are also introduced, including structure architecture, data representation, and software programming. For the laboratory schedule, ARDUINO environment is introduced for the major platform for designing and programming with practical application to devices including sensors, LEDs, motors, etc. Practical and innovative term projects are assigned as the group projects by proposal, and the full demonstration is scheduled with the contest.

Contents:

Laws for DC Circuit

Resistors and Voltage divider

Thevenin Equivalent Circuit

Design Rule for Circuit

Capacitors and RC Filters

Inductors and RLC Filters

Diode

Transistors

OP Amplifiers and Application

Digital Gates and Combinational Logics

Micro Processor System

Data Representation

Language Programming for Microprocessor

Demonstration and Contest

Evaluation: Attendance(10%), Mid Exam(20%), Final Exam(20%), Reports(10%),

Term Project(40%)

Text: Lecture Note (to be provided via eTL)

References:

1. The Art of Electronics, Paul Horowitz, Winfield Hill, Cambridge University Press,3rd edition, 2015

2. Student Manual for The Art of Electronics, Thomas C. Hayes, Paul Horowitz, Cambridge University Press, 1989

3. Microcomputer Systems: The 8086/8088 Family Architecture, programming, and Design, Yu-Cheng Liu, Glenn A. Gibson, Prentice-Hall, 1986