YEAR 082	EE 434, Industrial Instrumentation

Dr. Munir A. Al-Absi , B59-ROOM 1090, TEL:3696, **Office Hours:** Sat, Mon 12:30-01:30

# of Lectures	Topics	Lab Experiment
3	Introduction and basic definitions Measurement system, Types of signals Sensors, Actuators, Data Acquisition transducer Characteristics (linearity, calibration, compensation, working range, response time(bandwidth), passive and active transducers, digital transducers	**1. No Lab** **2.** 555 Timer **3.** Introduction to Labview
6	Temperature Sensors RTD, Thermistor (NTC and PTC) , IC Temp sensor & Thermocouples Temperature sensors selection criterion	**4.** Measurement and control using Labview
9	Signal conditioning circuits Operational Amplifier Difference Amplifier Instrumentation Amplifier Scaling and calibration Voltage -to-current converters A/D and D/A converters Sampling Rate and Nyquist criterion, Noise and noise margin	**5.** Bridge Circuit and Instrumentation Amplifier **6.** Temperature measurements using LM 35 converters **7.** A/D and D/A Converters **8.** No lab
3	Light sensors ,Photo resistors, Photo diodes, photo transistor, & opto-couplers, infrared system Ultrasound sensors	**9.** Voltage-to-current converters and scaling circuits **10.** Magnetic and light sensors application
5	Strain Gauges and Load cells Pressure measurements Flow measurements	**11.** LVDT , Strain gauge & Load Cell (Demo) **12.** Project
2	Level and displacement measurements. Displacement measurements using Potentiometer (linear and angular)& LVDT Level measurements Potentiometer arm, capacitive sensor in conductive and in nonconductive ials & ultrasound transmitter	**13.** Project **14.** Project **15.** Project presentations
2	Introduction to Foundation Fieldbus	

Grading: Quizzes 10%, Homework 5%, Midterm exam 25%, Term Project 10%, Lab(Attendance + Participation+ Reports)15%, Final Exam 35%