ERBIL POLYTECHNIC UNIVERSITY

زانکۆی پۆلیتەکنیکی هەولێر

College/ Institute	Erbil Technology College	
Department	Department of Automotive Industrial Technology Engineering	
Module Name	Sensors , Transducer and Interfacing	
Module Code	STI603	
Semester	6	
Credits	5	
Module type	Core	
Weekly hours	4	
Weekly hours (Theory)	(2)hr Class	(80)hr Workload
Weekly hours (Practical)	(2)hr Class	(55)hr Workload
Lecturer (Theory)	Truska Khalid M. Salih	
E-Mail	truska.muhamad@epu.edu.iq	
Lecturer (Practical)	Truska Khalid M. Salih	
E-Mail	truska.muhamad@epu.edu.iq	

Course Book

Course Description	The students will gain the following • The basic understanding of sensors, characteristic of sensors and industrial instrumentation system. • The sensor types and their application in industries. • Transducer types and characteristics. • Application of transducers in industries.
Course Objectives	• To make students aware about measuring instruments and the methods of measurement. • To make student familiar with the construction and working of different types of sensors and transducers interfacing
Student's Obligation	**Respect** A student has an obligation to exhibit honesty and to respect the ethical standards of the profession in carrying out his/her academic assignments. Without limiting the application of this principle. **Attendance** The student's absence must not exceed 10%. In the event that this percentage is exceeded, the student is considered to have failed in this module. **Questions** Asking questions about unclear material is an important part of the classroom experience. It is not uncommon for students to have similar difficulties, so speaking up will help everyone understand the discussed information. Teachers can also benefit from a student's questions. By finding out what subjects are hard to understand, instructors can adjust their lectures to clear up confusing topics. **Assignment** A student must submit the assignment on **Moodle** app. every week and also write a report about what he/she was studied in the laboratory
Assessment Scheme	16% Mid Term (Theory and practical) 4% Quiz 40% Assignment (report, paper, homework, seminar...) 25% final practical 15% final theory
Specific Learning Outcome:	1. Select the right sensor for a given application 2. Design a basic circuit building block 3. Simulate, synthesize , and layout a complete sensor and sensor type

	4. Design many types of sensors, transducer and interfacing.
Course References:	1. Patranabis.D, Sensors and Transducers, Wheeler publisher, 1994. 2. Jacob Fraden, "Hand Book of Modern Sensors: Physics, Designs and Application" Fourth edition, Springer, 2010 3. M. J. Usher, D. A. Keating, "Sensors and Transducers Characteristics, Applications, Instrumentation, Interfacing", 1996.

Course Topics (Theory)	Week	Learning Outcome
Characteristic of Sensors (Part1) ➢ Photo transistor ➢ Photo interrupter ➢ Magnetic sensor ➢ Pyro electric detector ➢ Thermistor ➢ Inclination sensors	1	
Characteristic of Sensors (Part2) • **Switches** ➢ Reed Switches ➢ Limit switch ➢ Mercury switch ➢ Vibration switches • **Microphones** ➢ Condenser Microphone ➢ Dynamic Microphone	2	
Temperature transducer	3	
General Purpose of Transducer	4	
Photovoltaic cell Humidity sensor	5	
Linear variable differential transformer	6	
Pressure sensor	7	
Ultrasonic sensor Infrared Transducer	8	
Interfacing consideration ➢ Interfacing consideration-bridges	9	

Topics	Week	Learning Outcome
➢ Interfacing consideration-interference		
Amplification and signal translation	10	
Offsetting and linearization	11	
Overall consideration; interference design examples	12	
Application of transducer Interfacing	13	
Topics	**Week**	**Learning Outcome**
➢ Photo transistor ➢ Photo interrupter ➢ Magnetic sensor	1	
➢ Pyro electric detector ➢ Thermistor ➢ Inclination sensors		
• **Switches** ➢ Reed Switches ➢ Limit switch ➢ Mercury switch ➢ Vibration switches • **Microphones** ➢ Condenser Microphone ➢ Dynamic Microphone	2	
General Purpose Of Transducer	3	
Thermocouple Temperature transducer	4	
Photovoltaic cell	5	
Humidity sensor	6	
Linear variable differential transformer	7	
Pressure sensor	8	
Ultrasonic sensor	9	
Infrared Transducer	10	
Pressure Transducer	11	

Interfacing basic sensor	12	
Line sensor interfacing	13	