

TITLE: SENSOR-BASED AUTOMATION

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SUPERVISOR AND TRAINER

Engr. Rezaul Karim
MSc in Sensor Technology
Coburg University, Germany

CO-ORDINATOR

Engr. Ariful Islam
BSc in CE, UITS, Dhaka

TRAINER

Engr. Shofiqul Islam
BSc in EEE, DUET, Gazipur

TRAINER

Engr. Shamim
BSc in EEE, DUET, Gazipur

Course fee	10,000 BDT
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TECHSENSE BANGLADESH LTD.

Cell: +8801974177909, Email: info@sensor-shopbd.com
Road#30, House#423(4th floor), Mohakhali DOHS, Dhaka
www.sensor-shopbd.com

Class #	Course title	Lecture details
01	Course overview	<p><u>Overview</u></p> <ul style="list-style-type: none"> ○ What does it mean Industrial automation? ○ What is sensor? ○ What is PLC? ○ What is the fourth-generation industry? ○ Basic concept of electrical engineering (Current and voltage divider rule, ohms law, series and parallel ckt, single line diagram)
02	Proximity sensor (inductive, capacitive, photoelectric, magnetic, hall)	<p><u>Proximity sensor</u></p> <ul style="list-style-type: none"> ○ What is proximity sensor? ○ Types of proximity sensors ○ How to choose a right proximity sensor ○ Industrial Applications ○ How to connection ○ Practical Project
03	Level sensor (Capacitive, ultrasonic)	<p><u>Level sensor</u></p> <ul style="list-style-type: none"> ○ Working principle of the level sensor ○ How to connect level sensor? ○ Capacitive Vs Ultrasonic level sensor ○ How to install level sensor? ○ Application in the industry ○ Practical experiment
04	PIR and Presence sensor (PIR, Presence and photocell)	<p><u>PIR sensor</u></p> <ul style="list-style-type: none"> ○ Working principle of a PIR sensor ○ PIR Vs Presence sensor ○ PIR Vs Photocell ○ Connection and application ○ Practical project
05	Pneumatic system (Cylinder, Solenoid Valve, Directional valve, Filter, Digital pressure switch)	<p><u>Pneumatic system</u></p> <ul style="list-style-type: none"> ○ Working principle of Pneumatic system ○ How to choose right cylinder ○ Types of cylinder ○ Solenoid valve details ○ Connection and application of the pneumatic system ○ Air compressor details ○ Practical project
06	Temperature and air quality sensor (CO ₂ sensor, Humidity sensor, PID controller)	<p><u>Air quality sensor</u></p> <ul style="list-style-type: none"> ○ Temperature vs Humidity ○ Absolute and relative humidity ○ Working principle of CO₂ sensor ○ What does it mean “PPM and PPB”? ○ How to choose right air quality sensor ○ Practical connection ○ Principle and application of PID controller ○ Installation of the CO₂ sensor

07	RTD VS Thermocouple (PT100, RTD)	<u>RTD and Thermocouple</u> <ul style="list-style-type: none"> ○ RTD Vs Thermocouple? ○ Why do you choose RTD or Thermocouple? ○ Connection and project ○ Practical project
08	Electrochemical sensors (O ₂ , SO ₂ , CO ₂ , CO, VOC)	<u>Electrochemical sensor</u> <ul style="list-style-type: none"> ○ Definition of the electrochemical sensor ○ Amperometric and galvanometric sensor ○ Gas detection principle ○ Industrial application
09	Relay and switch (Relay: MC, Ac & Dc Limit switch, micro switch, toggle switch, foot switch, push switch)	<u>Relay and switch</u> <ul style="list-style-type: none"> ○ Definition and principle of relay and switch ○ Magnetic contactor basic ○ Practical project ○ Magnetic contactor and timer
10	Circuit breaker	<u>Breaker</u> <ul style="list-style-type: none"> ○ Principle and operation of the circuit breaker ○ MC, MCB and MCCB ○ Practical experiment
11	Final project-01	
12	Final project-02	
13	Final project-03	
14	Final project-04	
15	Final project-05	
16	Exam (Theory and practical)	