IE 353 AUTOMATION Credit 3 (2-3) Major Course

First semester

Lecturers: 1. Mr.Sawat Pararach

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Pre- requisite : LE204 Introduction to Electrical Engineering

Objective :

1. Understanding of the mechanical and electrical control system
2. Understanding of the operation of Pneumatic and Hydraulic system
3. Understanding of the operation and programming the Programmable Logic Controller

Course Description :

Fundamental of programmable (PLC), operations of pneumatic and hydraulic systems, modern automatic systems in manufacturing processes.

Teaching schedule:

Week	Course topics
1	Introduction - Types of production - Types of industries - What is Automation - Reasons for Automation
2	Motion Actuators - Types of Motion and Motion Conversion - Electric Linear Actuators - Electric Rotary Actuators - Fluid power Actuators
3	Sensors - Binary

- Electrical position sensors
- Pneumatic position sensors

4. Introduction to switching theory
    - Binary elements
    - Basic Theorems of Switching Algebra
    - Karnaugh Maps

5 Pneumatic system
    - Preparation of compressed air
    - Pneumatic working elements
    - Basic pneumatic circuit
    - Basic-Electro-pneumatic circuit

6 Pneumatic system (continuous)
    - Sequence control for Pneumatic
    - Sequence control for Electro-Pneumatic

7 Introduction to Programmable Logic Controller
    - Introduction to PLC
    - PLC structure
    - Numeric and logic

8 PLC Operating
    - PLC operating
    - PLC language

9 Midterm

10 PLC Programming
    - Logic
    - Program execution
    - Latching Function

11 PLC Programming
    - Load Transfer
    - Timer and counter instructions
    - Comparison instruction

12 Application

13 Application

14 Hydraulic system

- Difference of Pneumatic and Hydraulic
- Hydraulic circuit

15 Modern automatic system in industry

- Numerical control
- DNC and CNC and Adaptive Control
- CAD/CAM/CAE/CIM

16 Modern automatic system in industry

- Robotics
- Automatic Material Handling and Storage
- AGVs
- CMM

Text Book: Lecture note

Reference books:

1. David W. Pessen , *Industrial Automation* , John Wiley & sons
2. Mikell P. Groover , *Automation Production Systems , and Computer Integrated Manufacturing* , Prentice - Hall International , Inc.
3. **สุเชียร เกียรติสุนทร** , ***หลักการทำงานและเทคนิคการประยุกต์ใช้งาน*** *PC/PLC*.
4. **บัณฑิต บัวบูชาและคณะ** , ***ทฤษฎีและการออกแบบวงจรดิจิตอล***.
5. **ปานเพชร ชินินทร และคณะ** , ***นิวแมติกส์อุตสาหกรรม***.
