

<b>COURSE</b>	Name	: Industrial Electronics and Robotics
	Code	: EE184644
	Credits	: 3
	Semester	: VI

### Description of Course

In this course, students will study the concept of SCADA system in the industry along with its constituent components which include instrumentation system, controller and control strategy, drive system as well as electronic data communication network in industry. Students study industrial robotics systems that include the introduction and application of industrial robots, robotic kinematics, robot motion planning, industrial robot programming, robot control, and industrial robots in CIM (Computer Integrated Manufacture).

### Learning Outcomes

#### Knowledge

(P03) Mastering the concepts and principles of design procedure in power systems, control systems, multimedia telecommunications, or electronics.

#### Specific Skill

(KK03) Able to describe system design for problem solving in power systems, control systems, multimedia telecommunications, or electronics by concerning technical standards, performance aspect, reliability, ease of application, and assurance of sustainability.

#### General Skill

(KU01) Able to apply logical, critical, systematic and innovative thinking in the context of development or implementation of science and technology that concerns and implements the value of humanities in accordance with their area of expertise.

#### Attitude

(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently.

### Course Learning Outcomes

#### Knowledge

Mastering the concept of electronics systems on Supervisory Control and Data Acquisition (SCADA) systems and their constituent electronic devices, and mastering robotics systems in the industry.

#### Specific Skill

Able to design and analyze electronics system in Supervisory Control and Data Acquisition (SCADA) system and its electronic device, and able to implement robotics system in industry.

#### General Skill

Able to analyze and take decisions in solving problems related to electronics and robotics systems in the industry.

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### Attitude

Demonstrating attitude of responsibility on work in his/her field of expertise independently.

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### Main Subjects

1. The concept of Supervisory Control and Data Acquisition (SCADA) systems and their constituent components.
2. Piping and instrumentation diagrams (P&ID) and engineering standards on electronic systems in the industry.
3. Electronics systems in the process of instrumentation and the driving system in the industry.
4. Electronic data communication system between SCADA system and communication protocol in industry.
5. Electronic systems in controlling devices and types of control strategies in the industry.
6. Programmable Logic Controller (PLC)
7. Planning and analysis of electronic systems on feedback control in the Industry.
8. Introduction and application of robots in industry
9. Kinematics of industrial robots
10. Industrial robot motion planning and industrial robot programming
11. Control of industrial robots and implementation of industrial robots in CIM (Computer Integrated Manufacture)

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### Reference(s)

- [1] Timothy J. Maloney (2011). *Modern Industrial Electronics*, 4/E, Prentice-Hall, Inc.
- [2] Bartelt, T. L. (2011). *Industrial automated systems: instrumentation and motion control*. Clifton Park, NY: Delmar.
- [3] Bruno Siciliano, dkk, *Robotics: Modeling, Planning and Control*, Springer-Verlag Limited, 2009.
- [4] Appin Knowledge Solution, *Robotics*, Infinity Science Press, 2007.
- [5] Lung-Wen Tsai, *Robot Analysis*, John Wiley and Sons, Inc., 1999.

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### Prerequisite(s)

EE184542 Embedded Electronic System  
EE184543 Sensors and Actuators

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