

<b>COURSE</b>	Name : Digital Control and Automation Laboratory
	Code : EE184721
	Credits : 3
	Semester : V

### Description of Course

These laboratory works provides practical understanding to the students about the forms of digital controller programming and the application of automation techniques in the industry, various digital programming & automation techniques in the industry, the principles of digital control & automation and various methods of ladder design in the field of automation, and instrumentation technology and process control.

### Learning Outcomes

#### KNOWLEDGE

(PO2) Mastering the concepts and principles of engineering, and implementing them in the form of procedures for analysis and design in power systems, control systems, multimedia telecommunications, or electronics.

#### SPECIFIC SKILL

(KK01) Able to formulate engineering problems in power systems, control systems, multimedia telecommunications, or electronics.

#### GENERAL SKILL

(KU12) Able to implement information and communication technology (ICT) in the context of implementation of his/her work

#### ATTITUDE

(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently  
(S12) Working together to be able to make the most of his/her potential

### Course Learning Outcomes

#### KNOWLEDGE

Mastering the concepts and principles of Digital Control

Mastering the concepts and principles of Automation System in Industry

#### SPECIFIC SKILL

Able to analyze and design Digital Control

Able to analyze and design Automation System in Industry

Able to provide consultation on the design and development of digital control and automation systems in the industry

#### GENERAL SKILL

Able to apply various digital controllers

Able to apply various design method of ladder diagram to Programmable Logix Controller (PLC) equipment

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Able to apply system technology products and other settings

**ATTITUDE**

Showing a responsible attitude towards the work in the field of expertise independently.

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**Main Subjects**

1. Practice on Sampling and Signal Reconstruction
2. Practice on Filtering Signals with Digital Filters
3. Practice on digital control programming for microcontroller on DC motor speed regulation system
4. Practice on digital control programming for PC on DC motor speed control system
5. Practice on ladder diagram programming based on sequence chart on PLC
6. Practice on ladder diagram programming based on cascade method on PLC
7. Practice on ladder diagram programming based on Grafchet on PLC
8. Practice on ladder diagram programming based on state diagram on PLC
9. Practice on ladder diagram programming based on Huffman method on PLC
10. Practice on ladder diagram programming based on Petri-Net on PLC

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**Reference(s)**

- [1] D. Pessen, Industrial Automation, Wiley, 1989
- [2] S. Baranov, Logic Synthesis for Control Automata, Kluwer Academic Publisher, 1994
- [3] Applying Structured Analysis To Automation Systems ( Paper 1)
- [4] The Principles of State Logic Control ( Paper 2 )
- [5] Tadao Murata, Petri Nets: Properties, Analysis and Applications, Proceedings of the IEEE, vol.77, no 4, April 1989 (paper 3)

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**Prerequisite(s)**

EE184622 Digital Control Systems  
EE184522 System Automation

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