PEI6I102   INDUSTRIAL AUTOMATION

(Prerequisite: Control System Engineering – I)

University level: 80%

ModuleI: (12Hours)

Process Control: Introduction: Process Definition, Feedback Control, PID Control, Multivariable Control. (Chapter 1 of Text Book 1)
PID Controller Tuning: Introduction, Zeigler-Nichols Tuning Method (Based on Ultimate Gain and Period, and Process Reaction Curve), Digital PID Controllers. (Chapter 13 of Text Book 2)

ModuleII: (15Hours)

Special Control Structures: Cascade Control, Feedforward Control, Feedforward- Feedback Control Configuration, Ratio Control, Selective Control, Adaptive Control, Adaptive Control Configuration. (Chapter 10 and 11 of Text book 3)
Actuators: Introduction, Pneumatic Actuation, Hydraulic Actuation, Electric Actuation, Motor Actuators and Control Valves. (Chapter 8 of Text Book 1

ModuleIII: (10Hours)

Industrial Automation: Programmable Logic Controllers: Introduction, Principles of operation, Architecture, Programming (Programming Languages, Ladder Diagram, Boolean Mnemonics) (Chapter 5 of Text Book 1)
Distributed Control: Distributed vs. Centralized, Advantages, Functional Requirements, System Architecture, Distributed Control Systems (DCS), Communication options in DCS. (Chapter 6 of Text Book 1)
Real-time Programming: Multi-tasking, Task Management, Inter-task Communication, Real-time Operating System. (Chapter 9 of Text Book 1)

Text Books:

1. *KrishnaKant,"Computer-BasedIndustrialControl",PHI,2009.*
2. *M. Gopal, "Digital Control and State Variable Methods" Tata McGraw Hill,2003.*
3. *SurekhaBhanot, Process Control: Principles and Applications, Oxford university Press,2010*

Reference Books:

1. *Smith Carlos and Corripio, "Principles and Practice of Automatic Process Control", John Wiley & Sons,2006.*
2. *Jon Stenerson, "Industrial Automation and Process Control", Prentice Hall,2003.*
3. *C. Johnson, "Process Control Instrumentation Technology", PHI, NewDelhi*
4. *D.R.Coughnowr,"ProcessSystemanalysisandControl",McGrawHill.*