INDUSTRIAL AUTOMATION AND CONTROL

PROF. SIDDHARTHA MUKHOPADHYAY
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IIT Kharagpur

TYPE OF COURSE: Rerun | Elective | UG/PG

COURSE DURATION: 12 weeks (18 Jan’ 21 - 09 Apr’ 21)

EXAM DATE: 24 Apr 2021

PRE-REQUISITES: Electrical Networks, Control Systems

INTENDED AUDIENCE: Any interested student

INDUSTRIES APPLICABLE TO: All Process Control (Oil and Gas, Chemical), Manufacturing (Machine tools, Textile) etc.

COURSE OUTLINE:
This course provides an overall exposure to the technology of Industrial Automation and Control as widely seen in factories of all types both for discrete and continuous manufacturing. The course, in 52 lectures, discusses a wide range of related topics from the advantage and architecture of automation systems, measurement systems including sensors and signal conditioning, discrete and continuous variable control systems, hydraulic, pneumatic and electric actuators, industrial communication and embedded computing and CNC Machines.

ABOUT INSTRUCTOR:
Prof. Siddhartha Mukhopadhyay has done is B. Tech, M. Tech and Ph. D., all from IIT Kharagpur in 1985, 1987 and 1991 respectively. In 1990 he joined the Electrical Engineering Department of IIT Kharagpur. He is currently a Professor in the Department. He has co-authored about 200 research papers, two books and two video courses. He has about 20 years experience of working with organisations like National Semiconductors, Texas Instruments, General Motors, Indian Railways, SAIL, DRDO, GE R&D and several others. Apart from his research interests he is interested in pedagogy and innovation.

COURSE PLAN:

Week 1: Introduction
Week 2: Measurement Systems Characteristics
Week 3: Introduction to Automatic Control
Week 4: Feedforward Control Ratio Control
Week 5: Special Control Structures
Week 6: Sequence Control. Scan Cycle, Simple RLL Programs
Week 7: PLC Hardware Environment
Week 8: Flow Control Valves
Week 9: Industrial Hydraulic Circuit
Week 10: Energy Savings with Variable Speed Drives
Week 11: The Fieldbus Network - I
Week 12: Course Review and Conclusion (Self-study)