PROF. SIDDHARTHA MUKHOPADHYAY

Department of Mechanical Engineering

IIT Kharagpur

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. A student of IIT Kharagpur once commented - " because of the course I can identify and relate to much of the equipment that I see in a factory".

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)