MANIPAL UNIVERSITY JAIPUR

School of Automobile Mechanical and Mechatronics Engineering

Department of Mechatronics Engineering
Course Hand-out

Programmable Logic Control | MC 1606 | 3 Credits

Session: Jan- May 2019 | Faculty: Anil Sharma

Course Outcomes: At the end of the course, students will be able to

MC1606.1 Identify different types of logical process used in industrial automation.

MC1606.2 Understand and connect the different switches, sensors and actuators with PLC.

MC1606.3 Classify and comprehend the working principle of various industrial processes such as traffic light control and bottle filling plant.

MC1606.4 Understand the advance programming concepts of PLC.

MC1606.5 Provide the information required to make knowledgeable decisions about PLC applications in various manufacturing environments and industries to enhance employability skills.

A.   SYLLABUS

Programmable Logic Controllers (PLCs) Introduction Parts of PLC Principles of operation PLC sizes PLC hardware components I/O section Analog I/O section Analog I/O modules, digital I/O modules CPU Processor memory module Programming devices Diagnostics of PLCs with Computers, PLC programming Simple instructions Programming EXAMINE ON and EXAMINE OFF instructions Electromagnetic control relays Motor starters Manually operated switches Mechanically operated and Proximity switches Output control devices Latching relays PLC ladder diagram Converting simple relay ladder diagram in to PLC relay ladder diagram, Timer instructions ON DELAY timer and OFF DELAY timer counter instructions Up/Down counters Timer and Counter applications program control instructions Data manipulating instructions math instructions, Applications of PLC Simple materials handling applications Automatic control of warehouse door Automatic lubricating oil supplier Conveyor belt motor control Automatic car washing machine Bottle label detection Process control application, PID control of continuous processes, Networking of PLCs, Controlling a robot with a PLC, PLC data move, jump functions, SKIP and MCR function, PLC arithmetic, number comparison, PLC Installation, troubleshooting and maintains.

B.   TEXT BOOKS

   i.   Frank D. Petruzella, Programmable Logic Controllers, McGraw- Hills Publications, 2004.
  ii.   William I. Fletcher, An Engineering Approach to Digital Design, Prentice Hall of India Publishers, New Delhi, 1999.
 iii.   Chareles H. Roth, Fundamentals of Logic Design, Fourth Edition, Jaico Publishing house, 1999.
  iv.   Frank D. Petruzella, Programmable Logic Controllers, McGraw- Hills Publications, 1989.
   v.   Reis & Reis, Programmable Logic Controllers, 5th edition, PHI Learning Publications, 2002.