MANIPAL UNIVERSITY JAIPUR

School of Automobile Mechanical and Mechatronics Engineering

Department of Mechatronics Engineering
Course Hand-out

Microprocessors and Microcontrollers| MC 1509 | 4 Credits

Session: Jul- Dec 2018 | Faculty: Kumar Gaurav

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

MC1509.1 Assess and solve basic binary math operations using the microprocessor and explain the microprocessor's and Microcontroller's internal architecture and its operation within the area of manufacturing and performance.

MC1509.2 Apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor and microcontroller.

MC1509.3 Compare accepted standards and guidelines to select appropriate Microprocessor (8085 & 8086) and Microcontroller to meet specified performance requirements.

MC1509.4 Analyse assembly language programs; select appropriate assemble into machine a cross assembler utility of a microprocessor and microcontroller.

MC1509.5 Design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to external devices.

MC 1509.5 Evaluate assembly language programs and download the machine code that will provide solutions real-world control problems and hence develop employability skill.

A. SYLLABUS

MICROPROCESSORS AND MICROCONTROLLERS: Introduction to microprocessor, History of Microprocessors, General block diagram of 8085, & 8086 with their instruction set. Introduction to microcontroller, History of Micro controllers, Embedded versus External memory devices, Microcontroller survey, CISC and RISC Microcontrollers, Harvard and von Neumann Architecture, Commercial Micro controller Devices, Introduction to 8051 family, History of 8051,Architectural features of 8051,Programming model. Pin details, I/O Ports, Power down operation, Addressing Mode, Instruction set of 8051 and Programming, Programming the 8051 resources, Counters, Timers, Serial Interface, Multiprocessor communication and Interrupts, Measurement of frequency, period and pulse width of a signal, Peripheral Interfacing- memory interfacing, Key board, LCD, stepper motor, Seven Segment Display, Digital to analog Converter, Analog to Digital converters, The 8051 based system design- case studies, Traffic light control, and Washing machine control, mining problem, Turbine monitor, Introduction to PIC Microcontrollers- Architectural and Peripheral features, ALU, CPU, Memory map, clock, pipelining, addressing and I/O ports.

B. TEXT BOOKS

i. K. Kant, Microprocessors and Micro controllers, PHI learning publications, 2007.
ii. M. A. Mazidi, J. G. Mazidi, & R. D. Mckinlay, 8051 Microcontroller and Embedded Systems Using Assembly and C, Pearson Education, 2010.
iii. A.V. Deshmukh, Micro controllers- Theory and Applications, Tata McGraw Hill, New Delhi, 2008.
iv. J. A. Kenneth, The 8051 Microcontroller Architecture, programming and applications, Penram International Publications, Mumbai, 2008.
v. C.R. Venkataramana, Mechatronics, Sapna Book house, Bangalore, 2001