

MEIC - 301 (A) Advanced Microprocessor

Unit 1

INTRODUCTION: MP overview, Data representation, addresses, operation.

Unit 2

8086 ARCHITECTURE: CPU, operation, instruction, formats and execution timing, addressing modes,. 8086. ALP Instructions arithmetic, branch, loop, NOP and HL T logic, shift and rotate, Directives and operations Assembly process.

Unit 3

MODULAR PROGRAMMING Linking and relocation, stacks, Procedures, Interrupts, Macros, program design, I/O PROGRAMMING Programmed I/O, Interrupt I/O, Block transfer and DMA. MULTI PROGRAMMING Process management, common procedure sharing, Memory management, virtual 0= memory and 80286.

Unit 4

I/O INTERFACE: Series and parallel communication interface, programmable timers and counters, DMA controllers

Unit 5

MULTIPROCESSOR CONFIGURATION 8086/8088 based multiprocessing systems, 8087 numeric data processor, 8089 I/O processor 80286/80287- TASKS Single level, multilevel, Multiple, Interrupt system, Interfacing

Unit 6

SINGLE CHIP MICROCOMPUTERS

Architecture of 8084/8078 pin out ALP, UPI (5)

BOOK RECOMMENDED:

1. Micro computer systems: The 8086/8088 family, second edition by Y C Liu and G A Gibson, PHI, 1986.
2. Digital Systems by S K Bose, Wiley Eastern, 1986.

MEIC - 302 (A) Robotics

Unit 1

Basic concepts in robotics, classification and structure of robotic systems, the manipulators. Drives and control systems, Kinetic analysis and coordinate transformation. The inverse kinematics problem, work space analysis and trajectory planning. Differential motion and statics, joint space singularities, the manipulator jacobian, Induced joint torques and forces.

Unit 2

MANIPULATOR DYNAMICS: Lagranges equation, kinetic and potential energy, Generalized force, Lagrange-Euler dynamic model. Dynamic model of a two axis and three axis robot, Direct and inverse dynamics, Recursive Newton-Euler formulation, Dynamic model of a one axis Robot (Inverted Pendulum)

Unit 3

ROBOT CONTROL The control problem, state equations, constant solutions, Linear feedback systems, single axis PID control PD-gravity control, computed torque control, variable-structure control, Impedance control.

Unit 4

ROBOT VISION Image representation Template matching, Polyhedral objects shape analysis, segmentation, Iterative processing, perspective transformation structured Illumination.

Unit 5

TASK PLANNING Task-level programming, Uncertainty configuration space, Gross motion planning, Grasp planning Fine motion planning, simulation of planar motion, A Task-planning problem.

BOOK RECOMMENDED:

1. Fundamentals of Robotic Analysis and Control by: Robert J Schilling (Prentice- Hall of India, Pvt Ltd,) 1997 Edition
2. Robotics for Engineers by: Yoram-Koran, Mc Graw-Hill book company.