GE 401C **Microprocessors and Interfacing**

L T P CR
3 0 0 3

Theory : 75
Class Work : 25
Total : 100
Duration of Exam : 3 Hrs.

Course Objectives:

- To introduce the architecture and Operations of 8085 and 8086 microprocessor
- To study the addressing modes, instruction set and programming of 8085 & 8086.
- To introduce the various types of interrupts of 8085 and 8086 microprocessor
- To introduce various peripheral devices (8255, 8254, 8259 and 8257)
- To introduce various methods of interfacing of Peripherals with 8085/8086 microprocessor.

Syllabus

PART A

UNIT 1. ARCHITECTURE OF 8085:

Functional block diagram—Registers, ALU, Bus systems. Pin configuration, Timing and control signals, Machine cycle and timing diagrams. Interrupts—Types of interrupt, interrupt structure.

UNIT 2. PROGRAMMING OF 8085:

Instruction format, Addressing modes, Instruction set. Development of assembly language programs.

PART B

UNIT 3. INTERFACING DEVICES:

(a).The 8255 PPI chip: Architecture, pin configuration, control words, modes and Interfacing with 8085. (b). The 8254 PIC chip: Architecture, pin configuration, control words, modes and Interfacing with 8085.

UNIT 4. INTERRUPT AND DMA CONTROLLER:

(a). The 8259 Interrupt controller chip: Architecture, pin configuration, control words, modes

(b). The 8257 DMA controller chip: Architecture, pin configuration, control words, modes

PART C

UNIT 5. ARCHITECTURE OF 8086:

Functional block diagram of 8086, details of sub-blocks such as EU, BIU, memory segmentation, physical address computations, pin configuration, program relocation, Minimum and Maximum modes of 8086— Block diagrams and machine cycles. Interrupts—Types of interrupt, interrupt structure.

UNIT6. PROGRAMMING OF 8086:

Instruction format, Addressing modes, Instruction set. Development of assembly language programs, Assembler directives.

Course Outcomes:

On successful complete of this course, the students should be able to:
• Understand the architecture and Operations of 8085 and 8086 microprocessor
• Understand the addressing modes, instruction set and programming of 8085 & 8086.
• Understand the various types of interrupts of 8085 and 8086 microprocessor
• Understand various peripheral devices (8255, 8254, 8259 and 8257)
• Understand various methods of interfacing of Peripherals with 8085/8086 microprocessor

TEXT BOOKS:

1. Microprocessor Architecture, Programming & Applications with 8085: Ramesh S Gaonkar; Wiley Eastern Ltd.
2. Advanced Microprocessors and Peripherals by AK Ray & KM Bhurchandi, TMH Publications

REFERENCE BOOKS:

1. Microprocessors and interfacing: Hall; TMH
2. The 8088 & 8086 Microprocessors-Programming, interfacing, Hardware& Applications :Triebel & Singh; PHI
3. Microcomputer systems: the 8086/8088 Family: architecture, Programming & Design: Yu-Chang Liu & Glenn A Gibson; PHI. 4. Advanced Microprocessors and Interfacing: Badri Ram; TMH

GE-402 C **DIGITAL SIGNAL PROCESSING**

L T P CR
3 0 0 3

Theory : 75
Class Work : 25
Total : 100
Duration of Exam : 3 Hrs.

Course Objectives:

- To introduce the students about various types of signals and their representation.
- To introduce the students about Discrete-Time Systems
- To introduce the students about sampling of signals
- To introduce the students about z-transform and its properties
- To introduce the students about various types of filters and their structures.
- To introduce the students about multirate digital signal processing

SYLLABUS

UNIT 1. DISCRETE-TIME SIGNALS:

Signal classifications, frequency domain representation, time domain representation, representation of sequences by Fourier transform, properties of Fourier transform, discrete time random signals, energy and power theorems.

UNIT 2. DISCRETE-TIME SYSTEMS:

Classification, properties, time invariant system, finite impulse Response (FIR) system, infinite impulse response (IIR) system

UNIT 3. SAMPLING OF TIME SIGNALS:

Sampling theorem, application, frequency domain representation of sampling, reconstruction of band limited signal from its samples. Discrete time processing of continuous time signals, changing the sampling rate using discrete time processing.

UNIT 4. Z-TRANSFORM:

Introduction, properties of the region of convergence, properties of the Z-transform, inversion of the Ztransform, applications of Z-transform.

UNIT 5. BASICS OF DIGITAL FILTERS:

Fundamentals of digital filtering, various types of digital filters, design techniques of digital filters : window technique for FIR, bi-linear transformation and backward difference methods for IIR filter design, analysis of finite word length effects in DSP,FIR &IIR Filter structure-direct1,direct2,cascade and parallel, Application of DSP.

UNIT 6. MULTIRATE DIGITAL SIGNAL PROCESSING:

Introduction to multirate digital signal processing, sampling rate conversion, filter structures, multistage decimator and interpolators, digital filter banks.

Course Outcomes:

On successful complete of this course, the students should be able to:

• Understand about various types of signals and their representation and their implementation on MAT LAB.
• Understand Discrete-Time Systems, sampling of signals and their implementation on MAT LAB.
• Understand z-transform, its properties and their implementation on MAT LAB.
• Understand various types of filters, their structures and their implementation on MAT LAB.
• Understand multirate digital signal processing multirate digital signal processing

TEXT BOOKS :

1. Digital Signal Processing : Proakis and Manolakis; PHI

2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH

REFERENCE BOOKS:

1. Digital Signal Processing: Alon V. Oppenhelm;PHI

2. Digital Signal processing(II-Edition): Mitra, TMH

GE-403 C **Instrumentation and Control**

L T P CR
3 0 0 3

Theory : 75
Class Work : 25
Total : 100
Duration of Exam : 3 Hrs.

UNIT 1. UNITS STANDARDS AND ERRORS:

S.I. units, Absolute standards (International, Primary, Secondary, and Working standards),True Value, Errors(Gross, Systematic and Random); Static Characteristic of instruments(Accuracy, Precision, Sensitivity, Resolution and threshold)

UNIT 2. **MEASURING INSTRUMENTS:**

Construction , Operating principle , torque equation , shape of scale , use as Ammeter or as voltmeter (Extension of range) , use on AC / DC or both , advantages and disadvantages, errors(both on AC/DC)of PMMC types, electrodynamic type, moving iron type(attraction , Repulsion and combined attraction, repulsion types). Hot Wire type and induction type, electrostatic type instruments.

UNIT 3. TRANSDUCERS:

Transducers Measurement of Temperature, RTD, Thermistors, LVDT, Strain Gauge, Piezoelectric Transducers, Digital Shaft Encoders, Tachometer, Hall effect sensors.

UNIT 4. **MATHEMATICAL MODELING:**

Introduction, Control System, Types of Control Systems,Servo-mechanism,Mathemetical Model of a System, Mathematical Modeling of Mechanical Systems, , Mathematical Modeling of Electrical Elements, Analogous Systems, Block Diagram Algebra, Signal Flow Graphs,

UNIT 5. TIME DOMAIN ANALYSIS:

Introduction, Time Response, Standard Test Signals, Transfer Function, S – Plane, First Order System, Time Response of First Order System, Speed of Response, Unit Ramp Response of a First Order System, Second Order System, Impulse Response of Second – Order System, Unit Step Response of a Second Order System, Time Domain Specifications, Steady State Error and Error Constants, Type of Feedback Control Systems, Effect of Adding a Zero to a System.

UNIT 6. Compensation, PID Controller.

GE 404 C **DATA COMMUNICATION NETWORKING**

L T P CR
3 0 0 3

Theory : 75
Class Work : 25
Total : 100
Duration of Exam : 3 Hrs.

Course Objectives:

- To make students know about the data communication and networking
- To make students know about digital data communication
- To make students know about data Link Control, Link Configurations and Protocol principles
- To provide students mathematical formulations and the derivations of various parameters
- To make students know about Communication Networking Techniques
- To make students know about Computer Communication Architecture and ISDN Networks

Syllabus

Unit 1. Introduction to Data Transmission:

Overview of Data Communication and networking, Analog and Digital Data Transmission, Transmission Impairments, Various Transmission Media, Data Encoding.

Unit 2. Digital Data Communication Techniques:

Asynchronous And Synchronous Transmission, Error Detection and correction techniques, Physical interfaces

Unit 3. Data Link Control:

Link Configurations, Protocol principles (Error control, Flow control), Bit Oriented and character oriented protocol, Data link layer services, Link Control.

Unit 4. Multiplexing:

F.D.M. Synchronous TDM, Statistical TDM

Unit 5. Communication Networking Techniques:

Communication Networks, Circuit Switching, Message Switching, Packet Switching, Local Networking Technology, The bus / tree topology, the ring topology, Medium Access control protocols (CSMAlCD, Token ring, FDDI, DQDB).

Unit 6. Computer Communication Architecture:

OSI and TCP/IP Model, Protocol And Architecture, Networking Access protocols, Inter Networking, Transport layer Protocols, Session Service And Protocols, and Presentation! Application protocols

Unit 7. ISDN Networks:

Concepts and Architecture, Protocols

Text Books:

1. William Stallings, "Data and Computer Communication", PHI, 4th Ed.

2. Forouzan, "Data communications and networking",TMH

Reference Books:

1. Andrew Tanenbaum, "Computer Networking", PHI

2. Godbole, "Data communications and network", TMH

Course Outcomes:

On successful complete of this course, the students should be able to:

- Understand about the data communication and networking
- Understand about digital data communication
- Understand about data Link Control, Link Configurations and Protocol principles
- Understand about mathematical formulations and the derivations of various parameters
  Understand about Communication Networking Techniques
- Understand about Computer Communication Architecture and ISDN Networks