

Information Technology: 2/4 B.Tech., II-Semester
V. R. Siddhartha Engineering College: Autonomous

Code No.	Subject	Periods per week			Credits	Maximum Marks		Total Marks
		Lecture	Tutorial	Lab/Practice		Internal	External	
MAS 255	Probability & Statistics	3	1	-	4	30	70	100
EED 281	Basic Electrical Engineering	4	-	-	4	30	70	100
ITD 221	Operating Systems	3	1	-	4	30	70	100
ITD 222	Database Management Systems	4		-	4	30	70	100
ITD 223	Microprocessors and Interfacing	3	1	-	4	30	70	100
ITD 224	Java Programming	4	-	-	4	30	70	100
ITP 225	DBMS Lab	-	-	3	2	25	50	75
ITP 226	Java Programming Lab	-	-	3	2	25	50	75
ITP 227	Microprocessors Lab	-	-	3	2	25	50	75
HUP 272	Professional Communication Practice	-	-	2	1	25	-	25
	Total =	21	3	11	31	280	470	850

UNIT – I

Introduction to Electrical Engineering : Essence of electricity, Electric field; electric current, potential and potential difference, electromotive force, electric power, ohm' s law, basic circuit components, electromagnetism related laws, Magnetic field due to electric current flow ,force on a current carrying conductor placed in a magnetic field, Faradays laws of electromagnetic induction. Types of induced e.m.f, Kirchhoff' s laws. Simple problems.

Network Analysis : Basic definitions, types of elements , types of sources, resistive networks, inductive networks, capacitive networks, series parallel circuits, star delta and delta star transformation , Network theorems- Superposition , Thevenins' s, Maximum power transfer theorems and simple problems.

UNIT-II

Magnetic Circuits: Basic definitions, analogy between electric and magnetic circuits, magnetization characteristics of Ferro magnetic materials, self inductance and mutual inductance, energy in linear magnetic systems, coils connected in series, attracting force of electromagnets.

Alternating Quantities : Principle of ac voltages , waveforms and basic definitions, relationship between frequency, speed and number of poles, root mean square and average values of alternating currents and voltage, form factor and peak factor, phasor representation of alternating quantities, the J operator and phasor algebra, analysis of ac circuits with single basic network element, single phase series circuits, single phase parallel circuits, single phase series parallel circuits, power in ac circuits.

UNIT-III

Transformers : Principles of operation, Constructional Details, Ideal Transformer and Practical Transformer, Losses, Transformer Test, Efficiency and Regulation Calculations (All the above topics are only elementary treatment and simple problems).

Direct current machines: Principle of operation of dc machines, armature windings, e.m.f equation in a dc machine, Torque production in a dc machine, Operation of a dc machine as a generator, operation of a dc machine as a motor.

UNIT-IV

A.C Machines: Three phase induction motor, principle of operation, slip and rotor frequency, torque (simple problems). Synchronous Machines: Principle of operation, e.m.f. equation (Simple problems on e.m.f.).

Basic Instruments : Introduction, classification of instruments, operating principles, essential features of measuring instruments, Moving coil permanent magnet (PMMC) instruments, Moving Iron of Ammeters and Voltmeters(elementary Treatment only)

TEXT BOOKS

1. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshiah – TMH.
2. Basic Electrical Engineering –By T.K.Nagasarkar and M.S. Sukhija Oxford University Press.

REFERENCES

1. Theory and Problems of Basic Electrical Engineering by D.P.Kothari & I.J. Nagrath PHI.
2. Principles of Electrical Engineering by V.K Mehta, S.Chand Publications.
3. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin Pearson.

UNIT-I

Operating systems: Evolution of OS functions: - OS functions, Evolution, Batch processing systems, multiprogramming systems, time sharing systems, real time operating systems, OS structure.

Processes: Process definition, process control, interacting processes, implementation of interacting processes, threads.

Scheduling: Scheduling policies, Job Scheduling, Process Scheduling.

UNIT-II

Deadlocks: Definitions, Handling deadlocks, Deadlock detection and resolution, Deadlock avoidance.

Process synchronization: Implementing control synchronization, critical sections, classical process synchronization problems, Semaphores, critical regions, conditional critical regions, Monitors.

Inter-process communication: Inter-process Messages, implementing issues.

UNIT-III

Memory Management: Memory allocation preliminaries, Contiguous memory allocation, Non Contiguous memory allocation, Virtual memory using paging, Virtual memory using Semaphores.

IO Organization and IO programming: IO Organization, IO devices, Physical IOCS, Fundamentals file Organization.

File systems: Directory Structure, File protection, Allocation of disk space, Implementing File access, File sharing, File system reliability.

UNIT-IV

Comparison of UNIX, Linux, and Windows operating systems based on their Architectures.

Case Studies on File Locking using Semaphores, FIFO and LRU Implementation, and Simulation of Page Replacement Policy.

TEXT BOOK:

1. Operating System Principles – Abraham Silberschatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Operating Systems' - Internal and Design Principles, Stallings, Fifth Edition-2005, Pearson Education/PHI

REFERENCES:

1. An Introduction to Operating Systems Concepts and Practice, Pramod Chandra P. Bhatt, PHI.
2. Operating System a Design Approach – Crowley, TMH.
3. System Software an Introduction to Systems Programming, Leland L., Beck, Third Edition.

ITD-222

DATA BASE MANAGEMENT SYSTEMS

UNIT – I

Data base System Applications, data base System VS file System – View of Data – Data Abstraction – Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor – History of Data base Systems. Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

Relational Model: Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.

Relational Algebra and Calculus: Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

UNIT – II

SQL: Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity' s – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.

Functional Dependencies and Normalization for Relational Databases: Informal Design Guidelines for Relation Schemas - Functional Dependencies- Normal Forms Based on Primary Keys - General Definitions of Second and Third Normal Forms- Boyce-Codd Normal Form (BCNF)

Relational Database Design Algorithms and Further Dependencies : Algorithms for Relational Database Schema Design - Multivalued Dependencies and Fourth Normal Form -Join Dependencies and Fifth Normal Form - Inclusion Dependencies Other Dependencies and Normal Forms

UNIT – III

Transactions Processing Concepts: Introduction to Transaction Processing - Transaction and System Concepts -Desirable Properties of Transactions - Schedules and Recoverability - Serializability of Schedules.

Concurrency Control Techniques: Locking Techniques for Concurrency Control - Concurrency Control Techniques Based on Timestamp Ordering – Multiversion Concurrency Control Techniques- Optimistic Concurrency Control Techniques - Granularity of Data Items - Some Other Concurrency Control Issues

UNIT – IV

Overview of Storage and Indexing: Data on External Storage – File Organization and Indexing –Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning.

Storing data: Disks and Files: The Memory Hierarchy – Redundant Arrays of Independent – Disks –Disk Space Management – Buffer Manager – Files of records – Page Formats – record formats.

Hash Based Indexing: Static Hashing – Extendable hashing – Linear Hashing – Exendble vs. Liner hashing.

TEXT BOOKS:

1. Fundamentals of Database Systems, Ramez Elmasri, Shamkant B. Navathe, 3rd Edition.
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill, 3rd Edition

REFERENCES:

1. Introduction to Database Systems, C.J.Date Pearson Education
2. Data base Systems design, Implementation, and Management, Rob & Coronel 5th Edition. Thomson
4. Data base Management System Mathew Leon, Leon Vikas.
5. Data base Systems, Connoley Pearson education.

UNIT-I

An overview of 8085, Architecture of 8086 Microprocessor. Special functions of General purpose registers. 8086 flag register and function of 8086 Flags.

Addressing modes of 8086, Instruction set of 8086, Assembler directives, simple programs, procedures, and macros.

UNIT-II

Assembly language programs involving logical, Branch & Call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

Pin diagram of 8086-Minimum mode and maximum mode of operation. Timing diagram.

Memory interfacing to 8086 (Static RAM & EPROM). Need for DMA. DMA data transfer Method. Interfacing with 8237/8257.

UNIT-III

8255 PPI – various modes of operation and interfacing to 8086. Interfacing Keyboard, Displays, Stepper Motor and actuators. D/A and A/D converter interfacing.

Interrupt structure of 8086. Vector interrupt table. Interrupt service routines.

Introduction to DOS and BIOS interrupts. 8259 PIC Architecture and interfacing cascading of interrupt controller and its importance.

UNIT-IV

Serial data transfer schemes. Asynchronous and Synchronous data transfer schemes. 8251 USART architecture and interfacing. TTL to RS 232C and RS232C to TTL conversion. Sample program of serial data transfer. Introduction to High-speed serial communications standards, USB.

8051 Microcontroller Architecture, Register set of 8051, Modes of timer operation, Serial port operation, Interrupt structure of 8051, Memory and I/O interfacing of 8051.

TEXT BOOKS

1. Microprocessors and interfacing - Douglas V. Hall, TMH, 2nd Edition, 1999
2. Advanced microprocessor and Peripherals - A.K.Ray and K.M.Bhurchandi, TMH, 2000.

REFERENCES

1. Micro computer systems, The 8086/8088 Family Architecture, Programming and Design - Y.Liu and G.A. Gibson, PHI , 2nd edition.
2. Microprocessors 8086/ 8088 - Avatar singh and Triebel, PHI .
3. Assembly Language Techniques for the IBM PC - Alan R, Miller, BPB (for DOS and BIOS interrupts only)
4. Micro Controllers - Rajkamal, Pearson Education, 2005.
5. Design with PIC Micro Controllers – John B. Peatman, 2005.
6. 8051 Micro Controllers and Embedded Systems – Dr. Rajiv Kapadia, Jaico Publishers.
7. 8086 Micro Processor - Kenneth J. Ayala, Penram International/ Thomson, 1995.
8. 8051 Microcontroller - Kenneth J. Ayala, Penram International/ Thomson, 3rd Edition, 2005.

ITD-224

Java Programming

UNIT-I

Introduction to Java, comparison of Java with C, data types, operators, control and loop statements, classes and objects, inheritance, interfaces, encapsulation, polymorphism, packages and visibility.

UNIT-II

Streams and Files, applets, exception handling, event handling, AWT, swings

UNIT-III

Java database connectivity, servlets, java sever pages

UNIT-IV

Threads, networking, programs by using java.lang, java.util, java.io, and java.net packages.

TEXT BOOKS

1. Beginning Java 2, Ivor Horton, Wrox
2. Java in a Nutshell, Fifth Edition, David Flanagan, O'REILLY
3. Java How to Program, Seventh Edition, H.M.Deitel and P.J.Deitel, Pearson Education/PHI

REFERENCES

1. Thinking in Java , Fourth Edition , Bruce Eckel
2. Head First Java, Second Edition, Kathy Sierra and Bert Bates.
3. The Java Programming Language, Ken Arnold, and James Gosling, Addison-Wesley
4. The Java Language Specification, James Gosling , Addison-Wesley Professional
5. The Java Virtual Machine Specification , Second Edition, Tim Lindholm , Frank Yelling ,Prentice Hall PTR

1. Creating tables for various relations (in SQL)
2. Implementing the queries in SQL for
 - a) Insertion
 - b) Retrieval (Implement all the operation like Union, Intersect, Minus, in, exist, aggregate functions (Min.,Max...) ...etc.
 - c) Updation
 - d) Deletion
3. Creating Views
4. Writing Assertions
5. Writing Triggers
6. Implementing Operations on relations (tables) using PL/SQL
7. Creating FORMS
8. Generating REPORTS.

I. Microprocessor 8086:

1. Introduction to MASM/TASM/NASM.
2. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.
3. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.
5. DOS/BIOS programming: Reading keyboard (Buffered with and without echo) – Display characters, Strings.

II. Interfacing:

1. 8259 – Interrupt Controller: Generate an interrupt using 8259 timer.
2. 8279 – Keyboard Display: Write a small program to display a string of characters.
3. 8255 – PPI: Write ALP to generate sinusoidal wave using PPI.
4. 8251 – USART: Write a program in ALP to establish Communication between two processors.

III. Microcontroller 8051:

1. Reading and Writing on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.

1. Write a Java program that prints all real solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a , b , c and use the quadratic formula. If the discriminant $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.
2. The Fibonacci sequence is defined by the following rule. The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the n th value in the Fibonacci sequence.
3. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
4. Write a Java program that checks whether a given string is a palindrome or not.
Ex: MADAM is a palindrome.
5. Write a Java program for sorting a given list of names in ascending order.
6. Write a Java program to multiply two given matrices.
7. Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (use StringTokenizer class)
8. Write a Java program that reads a file name from the user then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
9. Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
10. Write a Java program that displays the number of characters, lines and words in a text file.
11. Write a Java program that:
 - a) Implements stack ADT.
 - b) Converts infix expression into Postfix form.
12. Write an applet that displays a simple message.
13. Write an applet that computes the payment of a loan based on the amount of the loan, the interest rate and the number of months. It takes one parameter from the browser: Monthly rate; if true, the interest rate is per month; otherwise the interest rate is annual.

14. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the + - X % operations. Add a text field to display the result.
15. Write a Java program for handling mouse events.
16. Write a Java program for creating multiple threads
17. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.
18. Write a Java program that lets users create Pie charts. Design your own user interface (With swings & AWT)
19. Write a Java program that allows the user to draw lines, rectangles and ovals.
20. Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle.
21. Write a Java program that illustrates how run time polymorphism is achieved.