

II Year – I Semester

Human Values and Professional Ethics

Unit – I: Introduction –Need, Basic Guidelines and Content

1. Understanding the need , basic guidelines, content and process for value Education
2. Self Exploration – What is it? – its content and process: ‘Natural Acceptance’ and Experiential Validation – as the mechanism for self explanation
3. Continuous Happiness and Prosperity – A look at basic Human Aspirations

Unit – II: Process for Value Education

1. Right Understanding, Relationship and Physical Facilities – basic requirements for fulfillment of aspirations of every human being with their correct priority
2. Understanding Happiness and prosperity correctly – A critical appraisal of the current scenario
3. Method to fulfill the above human aspirations; understanding and living in harmony at various levels

Unit – III: Understanding Harmony in the Human Being

1. Understanding human being as a co-existence of the sentient ‘I’ and the material ‘Body’
2. Understanding the needs of Self (‘I ’) and ‘Body’ – Sukh and Suvidha
3. Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)

Unit –IV: Harmony in Myself

1. Understanding the characteristics and activities of ‘I’ and harmony in ‘I’
2. Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of Physical needs, meaning of Prosperity in detail
3. Programs to ensure Sanyam and Swasthya – practice exercises and Case Studies will be taken up in Practice Sessions

Unit – V: Understanding Harmony in the Family and Society – harmony in Human - Human Relationship

1. Understanding harmony in the family – the basic unit of human interaction
2. Understanding values in human relationship; meaning of Nyaya and Program for its fulfillment to ensure Ubhay-tripti
3. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

Text Books

- R R Gaur, R,Sangal, G.P Bagaria, 2009, A Foundation Course in value Education(English)
- Pradeep Kumar Ramancharla, 2013, A foundation course in value education (Telugu)
- R R Gaur, R Sangal G P Bagaria, 2009, Teacher's Manual (English)
- Pradeep Kumar Ramancharla, 2013, Teacher's Manual (Telugu)

Reference Books

- Ivan Illich, 1974, Energy& Equity, The Trinity Press, Worcester, and harper Collins, USA
- E.F. Schumacher, 1973, small is Beautiful; a study of economics as if people mattered,
- Blond & Briggs, Bratain
- A Nagraj, 1998, Jeevan vidya to Na Prayanam, Hyderabad
- R.Pradeep Kumar, 2013, Jeevan Vidya to Na Prayanam, Hyderabad
- Sussan George, 1076, How the other half Dies, Penguin Press, Peprinted 1986, 1991
- PL Dhar, RR Gaur, 1990, Science and Humanism, common wealth publishers

II Year – I Semester

Discrete Mathematical Structures

Unit 1 The Foundations: Logic and Proofs: Propositional Logic – Propositional Equivalences – Predicates and Quantifiers – Nested Quantifiers – Rules of Inference – Introduction to Proofs – Proof Methods and Strategy

Basic Structures: Sets, Functions, Sequences and Sums: Sets – Set Operations – Functions – Sequences and Summations

The Fundamentals : Algorithms , The Integers and Matrices: Algorithms – The Growth of Functions – Complexity of Algorithms – The Integers And Divisions – Primes and Greatest Common Divisors – Integers and Algorithms – Applications of Number Theory – Matrices

Unit 2 Introduction and Recursion : Mathematical Induction – Strong Induction and Well-Ordering – Recursive Definitions and Structural Induction – Recursive Algorithms – Program Correctness

Counting: The Basics of Counting – The Pigeon Hole Principle – Permutations and Combinations – Binomial Coefficients – Generalized Permutations and Combinations – Generating Permutations and Combinations

Unit 3 Advanced Counting Techniques: Recurrence Relations – Solving Linear Recurrence Relations – Divide and Conquer Algorithms and Recurrence Relations – Generating Functions – Inclusion – Exclusion – Applications of Inclusion & Exclusion

Relations : Relations and Their Properties – n-ary Relations and Their Applications – Representing Relations – Closures of Relations – Equivalence Relations – Partial Orderings

Unit 4 Graphs: Graphs and Graph Models – Graph Terminology and Special Types of Graphs – Representing Graphs and Graph Isomorphism's – Connectivity – Euler and Hamilton Paths – Shortest Path Problems – Planar Graphs - Graph Coloring

Unit 5 Trees: Introduction to Trees – Applications of Trees – Tree Traversal – Spanning Trees – Minimum Spanning Trees

Boolean Algebra: Boolean Functions – Representing Boolean Functions – Logic Gates – Minimization of Circuits

Text books

	Author	Title	Publisher
1	Kenneth H Rosen	Discrete Mathematics and its Applications	6 th Edition, McGraw-Hill (2007) Chapters(1-10)

Reference books

	Author	Title	Publisher
1	Ralph P. Grimaldi, B.V. Ramana	Discrete and Combinational Mathematics	5 th Edition, Pearson Education (2008).
2	Swapam Kumar Sarkar	A Text Book of Discrete Mathematics	S.Chand (2008)
3	D.S.Malik and M.K.Sen	Discrete Mathematical Structures	Thomson (2006)

II Year – I Semester Computer Organization

Unit 1 **Digital Logic Circuits:** Digital Computers, Logic Gates, Boolean algebra, Map Simplification, Combinational Circuits, Flip-flops, Sequential Circuits.

Digital Components: Integrated Circuits, Decoders, Multiplexers, Registers, Shift Registers, Binary Counters, Memory Unit.

Data Representation: Data types, Complements, Fixed-point Representation, Floating-point representation, other binary codes, Error detection Codes.

Unit 2 **Register Transfer and Micro operations:** Register transfer language, Register transfer, Bus & memory Transfers, Arithmetic micro operations, logic micro operations, Shift micro operations, Arithmetic Logic Shift Unit

Basic Computer Organization and Design: Instruction Codes, Computer registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Input-output Interrupt

Unit 3 **Micro programmed Control:** Control memory, Address Sequencing, Micro program Example, Design of control Unit.

Central Processing Unit: General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control

Unit 4 **Computer Arithmetic:** Introduction, Addition and subtraction, Multiplication algorithm, Floating point arithmetic operations, Decimal Arithmetic unit, Decimal Arithmetic operations.

Unit 5 **Input-Output Organization:** Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory

Text books

	Author	Title	Publisher
1	M. Morris Mano	Computer System Architecture	3 rd Edition, Pearson Education (2008). Chapters : 1, 2, 3, 4, 5.1 to 5.7, 7, 8.1 to 8.7, 10.2 to 10.5, 11.1 to 11.5, 12.1 to 12.5

Reference books

	Author	Title	Publisher
1	V. Rajaraman, T. Radha Krishnan	Computer Organization and Architecture	PHI
2	Behrooz Parhami	Computer Architecture	Oxford (2007)
3	ISRD group	Computer Organization	ace series, TMH (2007)
4	William Stallings	Computer Organization and Architecture – Designing for Performance	Pearson Education (2005)
5	P.Chakraborty	Computer Architecture and Organization	Jaico Books (2008)

II Year – I Semester Computer Networks

Unit 1 **Introduction** : Uses of Computer Networks: Business Application, Home Applications, Mobile Users – Social Issues. Network Hardware : Local Area Networks – Metropolitan Area Networks – Wide Area Networks – Wireless Networks – Home Networks – Internetworks. Network Software: Protocol Hierarchies – Design Issues for the Layers – Connection Oriented and Connectionless Services – Service Primitives – The relationship of Services to Protocols. Reference Models: The OSI Reference Model – The TCP/IP Reference Model – A Comparison of OSI and TCP/IP reference Model

Physical Layer: Guided Transmission Media: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics

Data Link Layer: Data Link Layer Design Issues: Services Provided to the Network Layer – Framing – Error Control – Flow Control. Error Detection and Correction: Error correcting Codes – Error Detecting Codes. Elementary Data Link Protocols : An unrestricted Simplex Protocol – A simplex Stop- and – wait Protocol – A simplex Protocol for a Noisy channel. Sliding Window Protocols: A one-bit sliding Window Protocol – A Protocol using Go Back N – A Protocol using selective Repeat.

Unit 2 **The Medium Access Control Sublayer** : Ethernet : Ethernet Cabling – Manchester Encoding – The Ethernet MAC sublayer Protocol – The Binary Exponential Backoff Algorithm – Ethernet Performance – Switched Ethernet – Fast Ethernet – Gigabit Ethernet – IEEE 802.2: Logical Link Control – Retrospective on Ethernet. Wireless Lans: The 802.11 Protocol Stack - The 802.11 Physical Layer - The 802.11 MAC sublayer Protocol– Local Internetworking – Spanning Tree Bridges – Remote Bridges – Repeaters, Hubs, Bridges, Switches, Routers and Gateways – Virtual LANs.

Unit 3 **The Network Layer:** Network Layer Design Issues : Store – and Forward Packet Switching – Services Provided to the Transport Layer – Implementation of Connectionless Services – Implementation of Connection Oriented Services – Comparison Of Virtual Circuit and Datagram subnets. Routing Algorithms : The Optimality Principle – Shortest Path Routing – Flooding – Distance Vector Routing – Link State Routing – Hierarchical Routing – Broadcast Routing – Multicast Routing – Routing for Mobile Hosts. Internet Working : How Networks Differ – How Networks can be connected – Concatenated Virtual Circuits – Connectionless Internetworking – Tunneling – Internet work Routing – Fragmentation. The Network Layer in the Internet: The IP Protocol – IP address – Internet Control Protocols – OSPF

Unit 4 **The Transport Layer:** The Transport Service: Services provided to the Upper Layers – Transport Services Primitives – Berkeley Sockets. Elements of Transport Protocols : Addressing – Connection Establishment – Connection Release – Flow Control and Buffering – Multiplexing – Crash Recovery. The Internet Transport Protocols :UDP

Introduction to UDP – Remote Procedure Call – The Real Time Transport Protocol. The Internet Transport Protocols: TCP Introduction to TCP – The TCP

Service Model – the TCP Protocol – The TCP segment header – TCP connection establishment – TCP connection release – Modeling TCP connection management- TCP Transmission Policy – TCP congestion Control – TCP Timer Management – Wireless TCP and UDP – Transactional TCP.

Unit 5 The Application Layer: DNS : The Domain Name System : The DNS Name Space – Resource Records – Name Servers. Electronic Mail : Architecture and Services – The User Agent – Message Formats – Message Transfer – Final Delivery. The World Wide Web: Architecture Overview – Static Web Documents – Dynamic Web Documents – HTTP – The Hyper Text Transfer Protocol

Text books

	Author	Title	Publisher
1	Andrew S. Tanenbaum	Computer Networks	Fourth Edition, PHI Chapters: 1.1 to 1.6, 2.2, 3.1 to 3.4, 3.6, 4.3, 4.4, 4.6, 4.7, 5.1, 5.2.1 to 5.2.9, 5.5, 5.6.1 to 5.6.5, 6.1.1 to 6.1.3, 6.2, 6.4, 6.5, 7.1 to 7.4

Reference books

	Author	Title	Publisher
1	James F.Kurose, Keith W.Ross	Computer Networking	Third Edition, Pearson Education
2	Behrouz A Forouzan	Data Communications and Networking	Fourth Edition, TMH (2007)
3	Michael A. Gallo, William M. Hancock	Computer Communications and Networking Technologies	Cengage Learning (2008)

II Year – I Semester

Object Oriented Analysis & Design

- Unit 1** **What is object orientation :** introduction, basic concepts, the origins of object orientation
Modelling concepts : models and diagrams, drawing activity diagrams , a development process
Requirements capture: user requirements, fact finding techniques, user involvement and documenting requirements, use cases, requirements capture and modeling.
- Unit 2** **Requirements analysis:** what must a requirements model do? , use case realization, the class diagram, assembling the analysis class diagram.
Object interaction : Object Interaction And Collaboration, Interaction Sequence Diagrams , Collaboration Diagrams
- Unit 3** **Specifying Operations :** The Role of Operation Specifications, Contracts, Describing Operation Logic, Object Constraint Language , Creating an Operation Specification
Specifying Control : States and Events, Basic Notation , Preparing a Statechart , Consistency checking
- Unit 4** **Moving Into Design :** How is Design Different from Analysis?, Logical and Physical design, System design and Detailed Design, Qualities and Objectives of Analysis and Design
System Design : The Major Elements of System Design, Software Architecture, Concurrency, Data Management Issues
Object Design : Class Specification, Interfaces, Criteria for Good Design, Designing Associations, Integrity Constraints, Designing Operations
Designing Boundary Classes: The Architecture of the Presentation Layer, Prototyping the User Interface, Designing classes , Designing Interaction with Sequence Diagrams, User Interface Design Patterns, Modelling the Interface using Statechart.
- Unit 5** **Data Management Design :** Persistence Designing for Relational Database Management Systems, Designing for Object Database Management Systems, Distributed Databases, Designing Data Management Classes
Implementation : Software Implementation, Component Diagrams, Deployment Diagrams, Software testing, User Documentation and Training

Text books

	Author	Title	Publisher
1	Simon Bennett, Steve MCRobb and Ray Farmer	Object Oriented Systems Analysis and Design Using UML	Second Edition, TATA Mc Graw Hill. Chapters: 4.1,4.2,4.3,5.2,5.3,5.4,6.2,6.3,6.4,6.5,6.6,6.7, 7.2,7.3,7.4,7.7,9.2,9.3,9.4,10.2,10.3,10.4,10.5, 10.6, 11.2,11.3,11.4,11.5,11.6, 12.2, 12.3, 12.4, 12.5,13.2,13.3,13.4,13.6,14.2,14.3,14.4,14.5,14.6, 14.7,17.2,17.3,17.4,17.5,17.7,17.8, 18.2,18.5, 18.6,18.7,18.8, 19.2,19.3,19.4,19.5,19.7

Reference Books

	Author	Title	Publisher
1	Booch, Jacobson, Rumbaugh	Object Oriented Analysis and Design with Applications	Kindle Edition.
2	Michael Blaha, James Rumbaugh	Object Oriented Modeling and Design with UML	Second Edition, PHI

II Year – I Semester

Design and Analysis of Algorithms

Unit 1 **Introduction** : What is Algorithm – Algorithm Specification : Pseudocode Conventions – Recursive Algorithms ; Performance Analysis: Space Complexity – Time Complexity – Asymptotic notation – Performance Measurement; Randomized Algorithms : Basics of probability theory – Randomized algorithms – Identifying the repeated element, Primality Testing – Advantages and Disadvantages.

Elementary Data Structures: Stacks and Queues ; Trees : Terminology – Binary Trees ; Dictionaries : Binary Search Trees ; Priority Queues : Heaps – Heapsort ; Sets and disjoint set Union : Introduction – union and find operations. ; Graphs: Introduction – Definitions – Graph Representations.

Unit 2 **Divide – and – conquer:** General Method – Defective Chess Board – Binary Search – Finding Maximum and Minimum – Merge Sort – Quick sort – Selection Problem ; Strassen’s Matrix Multiplication, Convex Hull: some geometric Primitives – The Quick Hull Algorithm – Graham’s scan – An $O(n \log n)$ divide – and – conquer algorithm.

The Greedy Method: The general Method – Container loading – Knapsack Problem – Tree Vertex Splitting – Job sequencing with deadlines ; Minimum cost spanning trees : Prim’s Algorithm – Kruskal’s Algorithm – Optimal Storage on tapes – Optimal Merge patterns – Single Source shortest paths.

Unit 3 **Dynamic Programming** : The general method – Multi-stage graphs – All pairs shortest paths – Single source shortest paths – Optimal Binary Search Trees – String editing – 0/1 Knapsack – Reliability design – The traveling sales person problem – Flow shop Scheduling

Basic Traversal and Search Techniques: Techniques for Binary Trees – Techniques for graphs : Breadth First Search and Traversal – Depth First Search ; Connected Components and Spanning Trees – Bi-connected components and DFS

Unit 4 **Backtracking** : The general method – The 8-queens problem – sum of subsets – Graph coloring – Hamiltonian Cycles – Knapsack Problem .

Branch and Bound : The Method: Least Cost search – The 15 puzzle – control abstractions for LC search – Bounding – FIFO Branch – and –Bound – LC Branch and Bound; 0/1 knapsack problem: LC Branch and Bound solution – FIFO Branch and Bound solution; Traveling Sales person.

Unit 5 **NP-Hard and NP – complete problems** : Basic concepts : Non deterministic algorithms –The classes NP hard and NP complex ; Cook’s theorem – NP hard graph problems : Clique Decision Problem – Node cover decision problem – chromatic number decision problem – Directed Hamiltonian cycle – Traveling sales person decision problem – and/or graph decision problem; NP-hard scheduling Problems: scheduling identical processors – flow shop scheduling – job shop scheduling; NP-hard code generation problems: code generation with common sub expressions – Implementing parallel assignment instructions; Some

simplified NP-hard problems.

Text books

	Author	Title	Publisher
1	Sartaj Sahni	Fundamentals of Computer Algorithms	Second Edition, Universities Press (2008) Chapters : 1 to 8 and 11

Reference books

	Author	Title	Publisher
1	Anany Levitin	Introduction to the Design & Analysis of Algorithms	Second Edition, Pearson Education (2007)
2	I.Chandra Mohan	Design and Analysis of Algorithms	PHI.
3	Prabhakar Gupta, Vineet Agrawal	Design and Analysis of Algorithms	PHI
4	Parag Himanshu Dave	Design and Analysis of Algorithms	Pearson Education (2008)

II Year – I Semester Computer Networks Lab

Cycle 1

- Program to implement bit stuffing and de stuffing.
- Program to implement character stuffing and de stuffing.
- Program to display the content of a file using URL class.
- Program to find Ip address of the system.
- Program to print factorial using RMI.
- Program to obtain information about Host, network, protocols, and Domain from URL.
- Echo server program connect using telnet client.
- TCP server program using server socket.
- TCP client program to send and receive the with TCP server.
- Program to create a server socket to handle multiple connections at a time.
- UDP server program using Data gram Socket.
- UDP client program to send and receive with UDP server
- Program to implement the Even parity on the given string.
- Program to implement the shortest path algorithm.
- Program to encrypt and decrypt the given plan text using A→Z, B→Y, Z→A.
- Program to encrypt and decrypt using cipher
Program to encrypt and decrypt the text using row transformation technique

Cycle 2

- Study the performance of OSPF by creating 20 nodes
- Create various traffic patterns of following distributions
 - Uniform
 - Binomial
 - Poisson

II Year – I Semester

Object Oriented Analysis & Design Lab

Objective : To develop a mini-project following the 12 exercises listed below using StarUML.

1. To develop a problem statement.
2. Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).
3. Identify Use Cases and develop the Use Case model.
4. Identify the business activities and develop an UML Activity diagram.
5. Identify the conceptual classes and develop a domain model with UML Class diagram.
6. using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
7. Draw the State Chart diagram.
8. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
9. Implement the Technical services layer.
10. Implement the Domain objects layer.
11. Implement the User Interface layer.
12. Draw Component and Deployment diagrams.

Suggested domains for Mini-project :

1. Passport automation system.
2. Book bank
3. Exam Registration
4. Stock maintenance system.
5. Credit card processing

II Year – I Semester Python Programming Lab

- 1 Compute the GCD of two numbers.
- 2 Find the square root of a number (Newton's method)
- 3 Exponentiation (power of a number)
- 4 Find the maximum of a list of numbers
- 5(a) Linear search
(b) Binary search
- 6(a) Selection sort
(b) Insertion sort
- 7 Merge sort
- 8 First n prime numbers
- 9 Matrix Multiplication
- 10 Programs that take command line arguments (word count)
- 11 Find the most frequent words in a text read from a file

II Year – II Semester Probability & Statistics

Unit 1 **Basic Probability** : Random Experiments, Sample spaces, Events, Axioms of Probability, Important Theorems of Probability, Conditional Probability, Theorem on Conditional Probability, Independent Events, Bayes Theorem

Descriptive Statistics : Measures of Central tendency, Mean, Median, Mode, Measure of dispersion, Variance and standard deviation, Percentiles, Interquartile Range, Skewness.

Unit 2 **Discrete Random Variables** : Random Variables, Discrete Probability distribution, Distribution functions for random variables, distribution functions for discrete random variables, Expected Values, Variance and Standard Deviation, Theorems on expectation, Theorems on variance
 Continuous Random Variables : Continuous Random variables, Continuous probability distribution, distribution functions for continuous random variables, Expected Values, Variance, Properties of Expected values and variances

Unit 3 **Examples of Random Variables:** Binomial Distribution, properties of binomial distribution, Normal Distribution, Examples of Normal Distribution, Poisson Distribution, Relation between Normal and Binomial distributions, Central limit Theorem.

Sampling Theory :Population and sample, Sampling, Random sampling, Random Numbers, Population parameters, Sampling statistics, Sampling distributions, Sample mean and sample variance.

Unit 4 **Estimation Theory** :Point Estimates and Interval Estimates, Confidence Intervals for means, Confidence Intervals for proportions, Confidence Intervals for differences and sums
 Test of Hypothesis and Significance : Test of hypothesis and significance, Type I and Type II Errors, Level of Significance, Test involving the Normal distribution, p value, One-tailed and two-tailed tests

Unit 5 **Curve Fitting, Correlation and Regression** : Curve Fitting, Regression, Method of least squares, least squares line, standard error of estimate, the linear correlation coefficient, generalized correlation coefficient, Correlation and dependence.
 Other Probability Distributions : Uniform distribution, gamma distribution, the F-distribution

Text Book

1. Probability and Statistics, Schaum's easy Outlines McGraw – Hill

Reference Books :

1. Introduction to Probability and Statistics, William Mendenhall, Robert J Beaver, Barbara M Beaver, Twelfth Edition, Thomson.

II Year – II Semester

Formal Languages and Automata Theory

- Unit 1** **The Theory of Automata :** Description of Finite Automation, Mathematical Model of Computer System., DFA, NFA, The equivalence of DFA and NFA, Mealy and Moore machines, Minimization of Finite Automata .
- Unit 2** **Regular sets and Regular Grammars :** Regular Expressions, Finite Automata and Regular Expressions, Pumping lemma for Regular sets, Applications of Pumping lemma, Closure properties of Regular Sets and Regular Grammar
- Unit 3** **Context Free Languages (CFL):** CFL and Derivation Trees, Ambiguity in CFG, Simplification of CFG, Pumping lemma for CFL.
- Pushdown Automata:** Definition, Pushdown Automata and CFL, Parsing and Pushdown Automata.
- Unit 4** **Turing Machines (TM):** TM Model and Representation, Language accepted by TM, Design of TM, Universal Turing Machines.
- Unit 5** **Formal Languages:** Chomsky classification of Languages, Operations on Languages, Languages and Automata, Undecidability, N-Hard and NP-Complete Problems.

Text books

	Author	Title	Publisher
1	K.L.P.Mishra, N.Chandrasekaran	Theory of Computer Science	PHI, Second Edition

Reference books

	Author	Title	Publisher
1	J.E. Hopcroft, Rajeev Motwani and J.D.Ullman	Introduction to Automata Theory, Languages and Computation	Pearson Education (2 nd edition)
2	Daniel I.A.Cohen	Introduction to Computer Theory	
3	Peter Linz	Theory of Computation	

II Year – II Semester

Microprocessors and Interfacing

- Unit 1** **8-bit Microprocessor architecture and Programming :** Introduction - Intel 8085 Microprocessor Architecture – Pin Description - Addressing Modes – Instruction Set – Assembly Language Programming - Stacks and Subroutines - Timing Diagrams
- Unit 2** **Memory and Peripherals Interfacing :** Interfacing Memory – Interfacing Peripherals – Interrupts – 8255 Programmable Peripheral Interface – Serial I/O and Data Communication – 8251 Programmable Communication Interface – 8279 Keyboard/Display Interface –8253 Programmable Interval Timer – 8259 Programmable Interrupt Controller.
- Unit 3** **16 bit Microprocessor architecture and programming :** Introduction - Evolution of Microprocessors – Intel 8086 Microprocessor Architecture – Pin description – External Memory Addressing – Bus Cycles. – Addressing Modes - Instruction Set – Directives – Assembly Language Programming
- Unit 4** **8-bit Micro Controller :** Introduction – Architecture of 8051 Microcontroller – Memory Organization – Pin Diagram – Timer/Counters – Serial Communication – Interrupts – Addressing Modes – 8051 Instruction – Assembly language Programming using 8051 Microcontroller
- Unit 5** **Design Using Microprocessor and Microcontroller :** Case studies – System Design using 8085 : Mining Problem – Turbine Monitor - System Design using 8051: Traffic Light Control - Washing Machine Control

Text Books :

1. Ramesh S. Gaonkar, Microprocessor Architecture, Programming and Applications with 8085, Penram International Publications, Fifth Edition, 2008.
2. Krishna Kant, Microprocessors and Microcontrollers – Architectures, Programming and System Design 8085, 8086, 8051, 8096, PHI, Sixth Edition, 2010.
3. Soumitra Kumar Mandal, Microprocessors and Microcontrollers: Architecture, Programming and Interfacing Using 8085, 8086 and 8051, Tata McGraw Hill, Sixth Reprint, 2012.

Reference Books :

1. Douglas V. Hall, Microprocessors and Interfacing, Programming and Hardware, McGraw Hill, 2012.
2. Mohamed Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay, The 8051 Microcontroller and Embedded Systems: Using Assembly and C, Second Edition, Pearson Education, 2011.

II Year – II Semester Operating Systems

- Unit 1** **Introduction :** What Operating Systems Do – Computer System Organization – Computer system Architecture – Operating System Structure – Operating System Operations – Process Management – Memory Management – Storage Management – Protection and Security – Distributed Systems – Special purpose Systems – Computing Environments.
- System Structure:** Operating System Services – User Operating System Interface – System Calls – Types of System Calls – System Programs – Operating System Design and Implementation – Operating System Structure – Virtual Machine – Operating System Generation – System Boot.
- Process Concept :** Overview – Process Scheduling – Operations on Processes – Interprocess Communication – Examples of IPC Systems – Communication in Client Server Systems.
- Unit 2** **Multithreaded Programming:** Overview – Multithreading Models – Thread Libraries – Threading Issues – Operating System Examples.
- Process Scheduling:** Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple Processor Scheduling – Thread Scheduling.
- Synchronization:** Background – The Critical Section Problem – Peterson’s solution – Synchronization Hardware – Semaphores – Classic Problem of Synchronization – Monitors – Synchronization Examples – Atomic Transaction.
- Unit 3** **Deadlocks:** System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock.
- Memory Management Strategies:** Background – Swapping – Contiguous Memory Allocation – Paging – Structure of the Page Table – Segmentation – Example: The Intel Pentium.
- Virtual Memory Management:** Background – Demand Paging – Copy on Write – Page Replacement – Allocation of Frames – Thrashing.
- Unit 4** **File System :** File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection.
- Implementing File Systems :**File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free Space Management – Efficiency and Performance – Recovery – Log structured File Systems.
- Unit 5** **Secondary Storage Structure :** Overview of Mass – Storage Structure – Disk Structure – Disk Attachment – Disk Scheduling – Disk Management – Swap Space Management – RAID structure.
- I/O Systems:** Overview – I/O Hardware – Application I/O Interface – Kernel I/O Interface – Transforming I/O requests to Hardware Operations – Streams –

Performance.

Text books

	Author	Title	Publisher
1	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne	Operating System Principles	Seventh Edition, Wiley. Chapters: 1.1 – 1.12, 2.1 – 2.10, 3.1 – 3.6, 4.1 – 4.5, 5.1 – 5.5, 6.1 – 6.9, 7.1 – 7.7, 8.1 – 8.7, 9.1 – 9.6, 10.1 – 10.6, 11.1 – 11.8, 12.1 – 12.7, 13.1 – 13.7

Reference books

	Author	Title	Publisher
1	William Stallings	Operating Systems – Internals and Design Principles	Fifth Edition, Pearson Education (2007)
2	Achyut S Godbole	Operating Systems	Second Edition, TMH (2007).
3	Flynn/McHoes	Operating Systems	Cengage Learning (2008).
4	Deitel & Deitel	Operating Systems	Third Edition, Pearson Education (2008)

II Year – II Semester Object Oriented Programming

Unit 1 **Object Oriented Programming:** Introduction to OOP, Objects and Classes, Characteristics of OOP, Difference between OOP and Procedure Oriented Programming.

Introduction to Java Programming: Introduction, Features of Java, Comparing Java and other languages, Applications and Applets, Java Development Kit, More Complex Programs, Java Source file structure, Prerequisites for Compiling and Running Java Programs.

Unit 2 **Java Language Fundamentals:** The building Blocks of Java, Data types, variable declarations, wrapper classes, Operators and Assignment, Control structures, Arrays, Strings, The String Buffer Class.

Java as an OOP Language: Defining classes, Modifiers, Packages, Interfaces.

Unit 3 **Exception Handling:** Introduction, Basics of Exception Handling in Java, Exception Hierarchy, Constructors and Methods in Throwable class, Unchecked and Checked Exceptions, Handling Exceptions in Java, Exception and Inheritance, Throwing User-defined Exceptions, Redirecting and Rethrowing Exceptions, Advantages of Exception – Handling Mechanism.

Multithreading: An Overview of Threads, Creating Threads, Thread Life-cycle, Thread Priorities and Thread Scheduling, Thread Synchronization, Daemon Threads, Thread groups, Communication of Threads.

Unit 4 **Files and I/O Streams:** An Overview of I/O streams, Java I/O, File Streams, FileInputStream and FileOutputStream, Filter streams, Random Access File, Serialization.

Applets: Introduction, Java applications versus Java Applets, Applet Life-cycle, Working with Applets, The HTML Applet Tag.

Database Handling Using JDBC: An Overview of DBMS, JDBC Architecture, Working with JDBC

Unit 5 **Servlets:** Introduction, How to run servlets, The Life-cycle of the servlet, servlet API, Multitier Applications using JDBC from a servlet.

Networking and Remote Method Invocation: Introduction to Networking, Understanding Ports, Networking Classes in JDK, Introduction to RMI, RMI Architecture – Implementing Remote class and interface – security.

Text books

Author	Title	Publisher
1 P. Radha Krishna	Object Oriented Programming through Java	Universities Press (2008) Chapters: 1,2,3,4,5,6.1-6.5,6.7,6.8,7,8.1-8.5,9.1-9.3,12.1-12.5, 13

Reference books

	Author	Title	Publisher
1	Cay S. Horstmann Gray Cornell	CoreJava ,Volume 1 Fundamentals	Eighth Edition, Pearson Education
2	E.Balagurusamy	Programming with Java	3e, TMH (2007)
3	H.M.Deitel, P.J.Deitel	Java How to Program	Sixth Edition, Pearson Education (2007)
4	Debasish Jana	Java and Object Oriented Programming Paradigm	PHI (2005).
5	ISR D Group	Introduction to Object Oriented Programming through Java	TMH (2007).

II Year – II Semester Engineering Drawing

UNIT – I

INTRODUCTION TO ENGINEERING DRAWING: Principles of Engineering Drawing/Graphics – Various Drawing Instruments – Conventions in Drawing – **Lettering practice** – BIS Conventions.

Curves: Constructions of Curves used in Engineering Practice:

- a) Conic Sections including the Rectangular Hyperbola – General method only.
- b) Cycloid, Epicycloid and Hypocycloid
- c) Involute.

Scales: Construction of different types of Scales, Plain, Diagonal, Vernier scale.

UNIT – II

ORTHOGRAPHIC PROJECTIONS IN FIRST ANGLE

PROJECTION: Principles of Orthographic Projections – Conventions – First and Third Angle projections.

Projections of Points: including Points in all four quadrants.

Projections of Lines: Parallel, perpendicular, inclined to one plan and inclined to both planes. True length and true angle of a line. Traces of a line.

PROJECTIONS OF PLANES: Plane parallel, perpendicular and inclined to one reference plane. Plane inclined to both the reference planes.

UNIT – III

PROJECTIONS OF SOLIDS: Projections of regular solids, cube, prisms, pyramids, tetrahedran, cylinder and cone, axis inclined to both planes.

SECTIONS AND SECTIONAL VIEWS: Right Regular Solids – Prism, Cylinder, Pyramid, Cone – use of Auxiliary views.

UNIT – IV

DEVELOPMENT OF SURFACES: Development of Surfaces of Right, Regular Solids – Prisms, Cylinder, Pyramids, Cone and their parts. frustum of solids.

INTERSECTION OF SOLIDS:- Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone.

UNIT – V

ISOMETRIC PROJECTIONS : Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions – Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of parts with Spherical surface.

TRANSFORMATION OF PROJECTIONS : Conversion of Isometric Views to Orthographic Views. Conversion of orthographic views to isometric views – simple objects.

PERSPECTIVE PROJECTIONS : Perspective View : Points, Lines and Plane Figures, Vanishing Point Methods (General Method only).

TEXT BOOKS

1. **Engineering Drawing – Basant, Agrawal, TMH**
2. **Engineering Drawing, N.D. Bhatt**

REFERENCES :

1. Engineering Graphics. P I Varghese Tata McGraw Hill Education Pvt. Ltd.
2. Engineering drawing – P.J. Shah .S.Chand Publishers.
3. Engineering Drawing- Johle/Tata Macgraw Hill Book Publishers.
4. Engineering Drawing – M.B. Shah and B.C. Rana, Pearson.
5. Engineering Drawing by K.Venu Gopal& V.Prabu Raja New Age Publications.
Engineering Drawing By John. PHI Learning Publisher

II Year – II Semester

Object Oriented Programming Lab (JAVA)

1. Write a program to demonstrate static variable and methods
2. Write a program to sort the characters in given string.
3. Write a program to search an element in the list using Binary search Algorithm.
4. Develop a class to implement 'Bank operations'
 - a. Balance Enquiry
 - b. Report
 - c. Withdraw
5. Write a program to guess a coin flip.
6. Write a program to implement method Overloading.
7. Demonstrate constructor chaining in Inheritance.
8. Design a Interface for shape, implement the interface with circle, rectangle, and square.
9. Create a package for Mathematical operations, write a program to use the package.
10. Write a program to print odd and even number in parallel using Threads
11. Write a program to demonstrate the Thread Priorities.
12. Write a program to Handle.
 - i. Array Index out of boards exception
 - ii. Divide zero Exception
 - iii. Arithmetic Exception.
13. Write a program to sum of command line arguments and count the invalid integers entered using exceptions.
14. Write a program to count no. of words, Vowels, lines in a given file.
15. Write a program to print the contents of given file
16. Write a program to copy the contents of one file to another file
17. Write an applet to draw a line between two points clicked the user.
18. Write a program to display record from a Emp. Table using JDBC
19. Write a program to show the employees of given department no.
20. Write a program for establishing a socket connection (Server Socket, Client Socket).

II Year – II Semester Microprocessors & Interfacing Lab

Cycle 1 : Experiments using 8085 Microprocessor

1. Arithmetic Operations and expression evaluation.
2. Block Operations (Move, Exchange, Compare, Insert and Delete).
3. Code Conversions.
4. Digital Clock Simulation.
5. Serial Communication.
6. Interrupt Programming and Moving Display.
7. Elevator Simulation.
8. Traffic Light Control.

Cycle 2 : Experiments Using 8086 Microprocessor with MASM

1. Arithmetic Operations.
2. Sorting and Searching

Cycle 3 : Experiments Using 8051 Microcontroller

1. Arithmetic operations.
2. ADC & DAC Interfacing.
3. Stepper Motor and DC Motor Interface.

II Year – II Semester UNIX & Operating Systems Lab

UNIX Programming Lab

1. Execution of various file/directory handling commands.
2. Simple shell script for basic arithmetic and logical calculations.
3. Shell scripts to check various attributes of files and directories.
4. Shell scripts to perform various operations on given strings.
5. Shell scripts to explore system variables such as PATH, HOME etc.
6. Shell scripts to check and list attributes of processes.
7. Execution of various system administrative commands.
8. Write awk script that uses all of its features.
9. Use sed instruction to process /etc/passwd file.
10. Write a shell script to display list of users currently logged in.
11. Write a shell script to delete all the temporary files.
12. Write a shell script to search an element from an array using binary searching.

Operating Systems Lab

1. Simulate the following CPU scheduling algorithms.
a) FCFS b) SJF c) Priority d) Round Robin
2. Simulate Dexter's Algorithm.
3. Simulate Readers and Writers problem.
4. Simulate Producer – Consumer problem.
5. Simulate the Three Memory Allocation Techniques.
a) FIRST FIT b) BEST FIT c) WORST FIT
6. Simulate all file allocation strategies
a) Sequential b) Indexed c) Linked
7. Simulate MVT and MFT.
8. Simulate Bankers Algorithm for Dead Lock Avoidance.
9. Simulate Bankers Algorithm for Dead Lock Prevention.
10. Simulate the following Page Replacement algorithms.
a) FIFO b) LRU c) Optimal d) LFU
11. Simulate Paging Technique of Memory Management.
Simulate Segmentation Technique of Memory Management