BHARATI VIDYAPEETH UNIVERSITY, PUNE
FACULTY OF ENGINEERING AND TECHNOLOGY

Programme: B. Tech. (Computer) – SEM III – 2014 Course

Sr. No.	Subject	Teaching Scheme (Hrs/Week)			Examination Scheme (Marks)							Credits		
		L	P/D	T	End Semester Examination	Continuous Assessment			TW & Practical	TW & Oral	Total	Theory	TW	Total
						Unit Test	Attendance	Assignments						
1	Fundamentals of Data Communication	3	--	1	60	20	10	10	--	--	100	4	-	4
2	Principles of Data Structures	3	2	--	60	20	10	10	50	--	150	3	1	4
3	Digital Techniques and Logic Design	3	2	--	60	20	10	10	--	50	150	3	1	4
4	Discrete Mathematics and Graph Theory	3	2	--	60	20	10	10	--	50	150	3	1	4
5	Engineering Economics and Management	3	--	--	60	20	10	10	--	--	100	3	--	3
6	Professional Skill Development- III	4	--	--	100	--	--	-	--	--	100	4	--	4
7	Programming Lab-I	--	4	--	--	--	--	--	50	--	50	--	2	2
	TOTAL	**19**	**10**	**1**	**400**	**100**	**50**	**50**	**100**	**100**	**800**	**20**	**05**	**25**

BHARATI VIDYAPEETH UNIVERSITY, PUNE

FACULTY OF ENGINEERING AND TECHNOLOGY

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		L	P/D	T	End Semester Examination	Continuous Assessment			TW & Practical	TW & Oral	Total	Theory	TW	Total
						Unit Test	Attendance	Assignments						
8	Engineering Mathematics- III	3	--	1	60	20	10	10	--	--	100	4	--	4
9	Computer Graphics and Visualization	3	2	--	60	20	10	10	50	--	150	3	1	4
10	Systems Programming	3	2	--	60	20	10	10	--	50	150	3	1	4
11	Fundamentals of Software Engineering	3	--	--	60	20	10	10	--	--	100	3	--	3
12	Microprocessors and Micro-controllers	3	2	--	60	20	10	10	50		150	3	1	4
13	Professional Skill Development- IV	4	--	--	100	--	--	-	--	--	100	4	--	4
14	Programming Lab-II	--	4	--	--	--	--	--	50	--	50	--	2	2
	TOTAL	**19**	**10**	**1**	**400**	**100**	**50**	**50**	**150**	**50**	**800**	**20**	**05**	**25**

Total Credits
Semester - III = 25
Semester - IV = 25
Grand Total = 50

01: FUNDAMENTALS OF DATA COMMUNICATION

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Theory: 03 Hours / Week	End Semester Exam: 60 Marks	04 Credits
Tutorial: 01 Hrs/Week	Unit Test: 20 Marks	
	Assignment :10 Marks	
	Attendance: 10 Marks	

Course Pre-requisites:

The Students should have

1. Knowledge of basic Engineering Mathematics

Course Objectives:

1. Create awareness among the students about theoretical aspects of data communication system

2. To make students aware of various modulation techniques, networking concepts, and error detection and analysis methods.

Course Outcomes:

1. Understand basic concepts and principles of data communications.

2. Differentiate between various Modulation Techniques and their applications.

3. Analyze codes used for Error Detection and Correction

4. Compare the switching techniques in data communication.

5. Comprehend various issues pertaining to Satellite Communications.

6. Gain substantial knowledge of evolution of Cellular communication systems.

UNIT - I **Fundamentals of data communications :** **(08 Hours)**

Simplified data communications model. Frequency Spectrum and Bandwidth. Analog and Digital data transmission - data andsignals, analog and digital transmission, their comparison, Digital data rate and bandwidth. Transmission impairments - Attenuation, Delay distortion, Noise, ChannelCapacity.

Transmission Media: Guided Transmission Media -Twisted pair wires, Coaxial,Optical fiber. Wireless Transmission - Terrestrial microwave, satellite microwave, broadcast Radio, Infrared.

UNIT - II Digital and Analog Transmission (08 Hours)

Digital Data, Digital Signal,Line coding- characteristics, Line coding schemes- Unipolar encoding: NRZ, RZ, Manchester, Differential Manchester. Bipolar encoding:- AMI, Block coding Analog Data, Digital Signal: Sampling, Sampling theorem, Nyquist rate, Pulse Amplitude Modulation (PAM), Pulse Code Modulation (PCM). PCM Encoder and Decoder, DPCM, ADPCM, Delta modulation. Analog Transmission: Modulation of Analog signals :AM, FM, and Phase Modulation. Digital Modulation Techniques –ASK, FSK, PSK, QAM. Modems. Multiplexing: FDM, TDM, statistical TDM, WDM,OFDM. Multiple Access Techniques: FDMA,TDMA,CDMA.

UNIT - III Information theory and Coding (08 Hours)

Information Rate,Shannon's theorem,Optimum Codes, Huffman Code, Code Efficiency, Error Control Coding, Methods of Controlling Errors, Types of Errors, Types of Codes, Error detection and correction capabilities, Hamming Distance, Hamming Bound, Hamming Codes, CRC Block Codes, Error Detection and Correction, Handshaking Techniques, FEC, ARQ - Stop and Wait, Go Back N, Selective Repeat, Channel Throughput and Efficiency.

UNIT - IV Transmission Modes and Telecommunication (08 Hours)

Parallel transmission, Serial transmission, Asynchronous transmission, synchronous transmission. Line Configurations, full duplex and half duplex transmission. Packet switching: Datagram, virtual circuit. Circuit switching and packet switching,(ISO-OSI) Seven layer model, Physical layer protocol, RS232,etc. Data link level Protocol HDLC, SDLC, X-25, LAN, WAN, ISDN. **Telephone Network**: Wire telephony, Subscriber loop, Trunk circuits. Four wire terminating set. PSTN, Frame Relay.

UNIT - V Satellite and Fiber Optic Communication (08 Hours)

Orbital aspects. Geostationary satellite, Station keeping, Frequency plans and polarization, Transponders, Multiple access methods. Line-of-Sight (LOS) issues in Satellite Communications. Fiber optic communication: Principle of light transmission in Fiber, types and modes of fiber, losses in Fiber. Dispersion, light sources and detectors, fiber optic communication link, Physical Layer of Wireless Media. Case Studies on recent communication technologies.

UNIT - VI Cellular Communication System (08 Hours)

Cell structure, Frequency reuse, Roaming, transmitter, Receiver, Special services provided by cellular phone, IEEE 802.11,WIFI, Bluetooth, GSM, GPRS. High-Speed Digital Access:- DSL Technology-ADSL, xDSL, Spread Spectrum-Concept, Frequency Hopping, Direct Sequence Cellular Telephony:- Basic concepts, Frequency–Reuse Principle, Transmitting, Receiving, Handoff, Roaming. First Generation, Second Generation-GSM, 3G Generation, 4G Networks. Case Studies on recent communication technologies.

Assignments:

1. Outline a comparison of all the various analog modulation techniques.
2. Solve Problems on Signal to Noise Ratio , Channel Bandwidth
3. Solve Problems on Sampling Theorem
4. Outline a comparison of all the various digital modulation techniques.
5. Solve Problems on Line Coding Techniques
6. Solve Problems on Information Rate
7. Solve Problems on Shannon's Channel Capacity Theorem
8. Solve Problems on Hamming Code
9. Solve Problems on CRC and FEC
10. Discuss LOS issues in Satellite Communication
11. Case Study on current generations of Cellular Mobile Communication System

Text Books:

1. William Stallings -Data and Computer communications - Prentice Hall of India,7th Edition.
2. Behrouz. A Forouzan, Data Communications and Networking, McGraw Hill ,4th edition .
3. Understanding Data Communications, John Wiley & Sons, Ltd7th Edition

Reference Books:

1. Andrews S. Tanenbaum -Computer Networks, Prentice Hall of India, 4th Edition.
2. Dennis Roddy, Satellite Communications Systems, John Wiley & Sons, Ltd 5th Edition
3. Richard Van Nee &Ramjee Prasad., "OFDM for Multimedia Communications", Artech House Publication, 2001.

Syllabus for Unit Test:

Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

02: PRINCIPLES OF DATA STRUCTURES

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Theory: 03 Hours / Week	End Semester Examination: 60 Marks	04 Credits
Practical: 02 Hours / Week	Unit Tests: 20 Marks	
	Assignment :10 Marks	
	Attendance: 10 Marks	
	Practical + Term Work: 50Marks	

Course Pre-requisites:

The Students should have

1. Knowledge of programming language C++

Course Objectives:

1. To develop skills to use appropriate data structures and selection of appropriate algorithm in computer engineering applications.

Course Outcomes:

1. Gain knowledge of basic concepts of data structures & Realization of ADT.
2. Apply the implementation of stack for evaluation of POLISH expressions, and other problems using C ++ compiler.
3. Differentiate between linear and nonlinear data structures and implement tree traversal techniques using recursive and non recursive methods.
4. Develop different algorithms for operations on Graphs. Implement programs using different sorting algorithms and Analyze for best, worst and average case.
5. Describe the characteristics of an algorithm, Gain knowledge of time and space complexity. Analyze for the searching algorithms.
6. Gain knowledge of decision problems.

UNIT - I

Introduction to Algorithm and Data Structures: **(06 Hours)**

Definition, ADT, Complexity of Algorithms, Asymptotic Notations, Big 'O' Notations, Types of Data Structures, Linear Arrays, Arrays as ADT, Representation of Linear Array, Traversing Linear Array, Searching in Linear Array, Representation of Polynomials using Arrays, Introduction to Stack, Stack as ADT, Array representation of Stacks, Introduction to Queue, Queue as ADT, Array Representation of Queue.

UNIT- II Linked List: **(06 Hours)**

Introduction, Singly Linked List ,Traversing, Searching , Insertion and Deletion from a Singly Linked List, Doubly Linked List, Circular Linked List, Stack using Linked List, Linked Representation of Queue, Circular Queue, Application of Stacks and queues.

UNIT III Trees: **(06 Hours)**

Introduction, Binary Trees, Binary Tree representation ,Recursive and Non recursive tree traversal algorithms, Threaded Binary Tree, Binary Search Tree, Huffman's Algorithm, AVL Trees, m-way Search Trees, general trees,B Trees, B+ Trees, Red Black Tree, Applications of Trees.

UNIT IV Graphs and Sorting techniques: **(06 Hours)**

Introduction, sequential and Linked representation of graph, Dijkstra's Algorithm , ADT for Graph, Traversing a Graph, minimum spanning Trees.
Sorting: Introduction, Bubble sort, Insertion sort, Selection Sort, Merge Sort, shell Sort, Radix Sort, Quick Sort, Hashing, Heap sort. Complexity Analysis of Algorithms.

UNIT V Design and Analysis of Algorithms I : **(06 Hours)**

Divide and Conquer The General Method, Greedy Method, Dynamic Programming, Basic Search and Traversal Techniques: Code Optimization, AND/OR Graphs.

UNIT VI Design and Analysis of Algorithms II : **(06 Hours)**

Game Trees, Backtracking: The 8-Queens Problem, Graph Coloring, Knapsack Problem, Branch and Bound Method, Introduction to NP- Hard, NP- Complete Problems, Polynomial Complexity .

List of Practical Assignments:

1. Analyze the Complexity of given algorithms and build program for it using c++.
2. Build a program for creation of Stack and Queue using arrays and perform all the operations on it.
3. Construct Linked List, Doubly Linked List, and Circular Linked List and perform all the operations on it.

4. Write a program for application of Stack and Queues.
5. Write a program for Recursive and Non-Recursive traversal on trees.
6. Explain a Huffman's algorithm and build a program in C++ for it.
7. Represent a graph in memory and Implement Dijkstra's algorithm.
8. Write an algorithm for illustrating Bubble Sort, and Quick Sort (any other sorting method may be implemented).
9. Discuss about Threaded Binary Tree, design algorithm for its illustration.
10. Write a program to Implement Minimum Spanning Tree.

Internal Assignment:

Implement mini project with suitable data structures studied in syllabus.

Reference Books:

1) Ellis Horowitz, Sartaj Sahani, "Fundamentals of Computer Algorithms", Galgotia Publications.

2) GA V Pai, "Data Structures and Algorithms, Concepts, Techniques and Applications, The McGraw Hill Publications.

3) Data structures using C and C++ by Langsam, Augenstein, Tenenbaum,PHI publication.

Syllabus for Unit Test:

Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

03: DIGITAL TECHNIQUES AND LOGIC DESIGN

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Theory: 03 Hours / Week	End Semester Examination: 60 Marks	04 Credits
Practical: 02 Hours / Week	Unit Test Tests: 20 Marks	
	Oral + Term Work: 50Marks	

Course Pre-requisites:

The Students should have

1. Knowledge of number system and codes

2. Basic Mathematics

Course Objectives:

1. To develop an ability to design system with combinational and sequential circuits elements

2. To introduce digital logic design software.

Course Outcomes:

1. Comprehend different number systems and Boolean algebraic principles.

2. Apply Boolean algebra to simplify and apply design logic.

3. Analyze a given digital system involving combinational circuit elements.

4. Design and Synthesize a system with sequential circuit elements.

5. Understand structure and characteristics of Memory.

6. Validate and implement the PLD based designs using both schematic capture and VHDL

UNIT - I Number Systems and codes: **(06 Hours)**

Binary, Octal, Decimal and Hexadecimal number Systems and their conversion, Binary Addition and Subtraction.

Boolean algebra and logic gates:- NAND-NOR Realization. De Morgan's theorems. Theorems and Properties of Boolean Algebra, Standard SOP and POS form,

Reduction of Boolean functions using Algebraic method, Karnaugh maps. Quine McCluskey Method.

UNIT - II Combinational logic design: **(06 Hours)**

Introduction, Half and Full Adder, Half and Full Subtractor, Four Bit Binary Adder and Subtractor, BCD Adder, code conversion, Multiplexers and Demultiplexer(IC 74153 & 74154), Decoders (IC 74138), Parity generator and checker.

UNIT - III Sequential Logic Design: **(06 Hours)**

Flip Flops: SR, D, JK, JK Master Slave and T Flip Flop, Truth Tables and Excitation Tables, Flip-flop conversion. Sequential circuit analysis, construction of state diagrams.
Counters: Design of Asynchronous and Synchronous Counters, Modulo Counters, UP- DOWN counter.
Shift Registers: SISO, SIPO, PIPO, PISO, Bidirectional Shift Register, Universal Shift Register.

UNIT - IV Memory : **(06 Hours)**

Random Access Memory, TTL RAM Cell, Parameters, Read/Write Cycles, ROM Types, EPROM Structure and Programming, MOS Static RAM Cell, Dynamic Cell, Refreshing, Memory Cycles.

UNIT - V Algorithmic State Machines: **(06 Hours)**

ASM state blocks, ASM Charts, Notations, ASM modeling styles, Design of Simple Controller, Multiplexed Controller Method, RTL Notations and Implementation.

PLD and PLA, Introduction to CPLD and FPGA

UNIT - VI Computer Aided Design of digital systems:- **(06 Hours)**

Functional Simulation, Timing Simulation, Logic synthesis and optimization, Introduction to VHDL, Introduction to HDL, Framework of VHDL program VHDL-Library, Entity, Architecture, Modeling Styles, Data Objects & Data Types, and Attributes.

Term Work: The sample practical assignments are given below. This can be used as a guideline and course coordinator can recommend the list of practical assignments.

1. To Describe and illustrate Boolean Functions Using Logic Gates
2. To describe and investigate Half adder, Full Adder, Half Subtractor and Full Subtractor Using Gates And IC's.
3. Illustrate and Investigate Bit Digital Comparator And ALU Verification
4. To describe and devise Up-Down Counter Using JK Flip-Flop.
5. To design and construct Modulo N Counter Using 7490 & 74190 (N>10).
6. To Examine and formulate how to realize Boolean Expression Using Multiplexer.

7. To describe Shift Registers: Shift Left, Shift Right, Parallel Loading And Pulse train Generator.
8. To Discuss on FPGA Devices.
9. To discuss about Typical RAM IC.
10. To Build Combinational Logic Using PLA

Text Books:

1)R. P. Jain, “Modern Digital Electronics”, Tata McGraw Hill

2) Malvino- Brown, “Digital Computer Electronics” Tata McGraw Hill.

3) Douglas L. Perry, “VHDL Programming by Example”, Tata McGraw Hill

Reference Books:

1) Donald p Leach, Albert Paul Malvino,“Digital principles and Applications”,Tata McGraw Hill.

2) Yarbrough John M. , “Digital Logic Applications and Design “, engage Learning

3) M. Morris Mano, “Digital Logic and computer Design”, PHI.

Syllabus for Unit Test:

Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

04: DISCRETE MATHEMATICS AND GRAPH THEORY

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Theory: 03 Hours / Week	End Semester Examination: 60 Marks	Theory:03 Credits
Practical: 02 Hours / Week	Unit Test Tests: 20 Marks	TW/Oral:01 Credit
	Assignment :10 Marks	
	Attendance: 10 Marks	
	Oral: 50 Marks	
	Total : 150 Marks	

Course Pre-requisites:

1. Knowledge of basic mathematics.

Course Objectives:

1. To create ability among the students to understand the difference between continuous mathematics and discrete mathematics.

2. To develop the skills to mathematically analyze the characteristics of various discrete structures

3. To develop the skills among the students to apply the discrete mathematical concepts in computer engineering applications

Course Outcomes:

1. Apply knowledge of mathematical and logical notation to define and formally reason about mathematical concepts.

2. Interpret and apply the operations and terminologies associated with relations and functions.

3. Gain knowledge of discrete mathematics techniques for constructing mathematical proofs.

4. Demonstrate and implement the basic concepts in graph theory.

5. Understand various concepts of algebraic systems.

6. Develop fundamental understanding of Elementary Combinatory.

UNIT - I **Mathematical Logic**: **(06 Hours)**

Propositional logic; negation ,disjunction and conjunction; implication and equivalence; truth tables; predicates; quantifiers; natural deduction; rules of Inference; methods of proofs; resolution principle; Set theory; Paradoxes in set theory; inductive definition of sets and proof by induction

UNIT - II **Relations:** **(06 Hours)**

Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Hasse diagram ,Lattices, Lattice and its Properties, Recurrence Relation: Calculating Coefficient of generating function, solving recurrence relation by substitution. Characteristics roots solution of In homogeneous Recurrence Relation.

UNIT - III **Functions:** **(06 Hours)**

Introduction, types of functions and characteristics of functions ,mappings; composition of functions; inverse functions; special functions; hashing functions, recursive function ,recursion in programming languages.

UNIT - IV **Graph Theory:** **(06 Hours)**

Representation of Graph, DFS, BFS, Spanning Trees, and planar Graphs. Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

UNIT - V **Algebraic structures**: **(06 Hours)**

Definition and elementary properties of groups, semi groups, monoids, rings, fields, Homomorphism of Groups and Semigroups, Group Codes,Error recovery in group code,vector spaces

UNIT - VI **Elementary Combinatorics:** **(06 Hours)**

Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Probability Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion –Exclusion. Pigeon hole principles and its application.

Term Work:

The sample practical assignments are given below. This can be used as a guideline and course coordinator can recommend the list of practical assignments.

1. To describe various operations on Set and illustrate the same using C program.
2. Formulate the approach for generating a Power Set of a given set and apply it using C language.
3. List various properties of Relation and construct a program to evaluate it.

4. To formulate a program to find the Transitive Closure of a given relation using C.

5. To Build a program in C for Depth First Search And Breadth First Search on a graph.

6. To state various operations on a Graph and illustrate it using C language.

7. To Justify whether an entered Graph is a Simple or Multiple devising c program.

8. To Produce a Minimal Spanning Tree from given graph Using C programming language.

9. To Examine whether the graph contains Hamiltonian path or Eulerian path using C code.

10. To Build a program to find the various cycles present in the graph.

Assignment:

1. The Term Work prescribed in the syllabus is continuous assessment by the concerned subject faculty.
2. In case of assignments for internal 10 Marks students will be assigned two assignments containing based on problems of different types or any programming assignment and guided for the solution of the problem.
3. The assignments are to be submitted as a hard copy

Text books

1) "Discrete Mathematical Structures" : Tremblay and Manohar, Tata McGraw Hill

2) "Discrete Mathematics" : 1st edition by Maggard, Thomso

3) C.L.Liu,Elements of Discrete Mathematics, 2nd Edition , McGraw Hill Pub

4) V. K. Balakrishn, Graph Theory, TMH (Recommended for Graph)

Syllabus for Unit Test:

Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

05: ENGINEERING ECONOMICS AND MANAGEMENT

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Theory: 03 Hours / Week	End Semester Examination: 60 Marks	03 Credits
	Unit Test: 20 Marks	
	Attendance:10 Marks	
	Assignments: 10Marks	
	Total Marks: 100 Marks	

Course Pre-requisites:

Students should have

1. Basic knowledge about communication skills.

2. General awareness of economics and financial terms.

Course Objectives:

1. To impart knowledge, with respect to concepts, principles of Economics, which govern the functioning of a firm/organization

2. To explain the students about concept of production, cost, national income, an aggregate supply and aggregate demand consumption.

3. To help the students to understand the fundamental concepts and principles of management, functions of management, various organizational structures and basic knowledge of marketing.

Course Outcomes:

1. Understand the fundamentals of economics and theory of demand and supply.

2. Describe concept of production and cost.

3. Explain the fundamentals of national income and Aggregate supply and aggregate demand consumption.

4. Comprehend the concepts of money and banking.

5. Brief the basic concepts of management and its functions.

6. Describe marketing, production and financial management concepts.

UNIT - I **Introduction to Economics** **(06 Hours)**

Definition of economics, Concept of money, value, goods, wealth, Concept of Engineering economics, Difference between Microeconomics & Macroeconomics, Nature of Economic problem, Relation between Science, Engineering, Technology and Economics. Firm-Meaning, objectives, Theories of firm- concept of profit maximization, Theory of Demand & Supply: determinants, law of demand, law of supply, equilibrium between demand & supply Elasticity: elasticity of demand, price elasticity, income elasticity, cross elasticity, concept of Capital.

UNIT - II **Theory of production** **(06 Hours)**

Theory of production: production function, factors of production (meaning & characteristics of Land, Labour, capital & entrepreneur), Law of variable proportions & law of returns to scale. Cost: short run & long run cost, fixed cost, variable cost, total cost, average cost, marginal cost, opportunity cost, Laws of costs. Break even analysis: introduction, numerical, Return on investment. Inventory Control, Quality related concepts.

UNIT - III **Markets** **(06 Hours)**

Markets: introduction, types of markets & their characteristics (Perfect Competition, Monopoly, Monopolistic Completion, Oligopoly). National Income: meaning, stock and flow concept, NI at current price, NI at constant price, GNP, GDP, NNP,NDP, Personal income, disposal income. Aggregate supply and aggregate demand consumption, Investment and saving functions.

UNIT - IV **Money** **(06 Hours)**

Concept of money and its functions, types. Meaning, objectives and tools of Monetary policy and fiscal policy. Banking: types, functions, Central Bank- RBI; its functions, concepts; CRR, bank rate, repo rate, reverse repo rate, SLR. Functions of central and commercial banks. Inflation, Deflation, Stagflation, Direct and Indirect taxes. . Monetary and cycles, new economic policy, Liberalisation, Globalisation, privatisation, market friendly state, fiscal policy of the government, Meaning and phases of business.

UNIT - V **Management and its functions** **(06 Hours)**

Introduction to Management, Nature, scope. Management & administration, skill, types and roles of managers. Management Principles: Scientific principles, Administrative principles, Maslow's Hierarchy of needs theory. Functions of Management: Planning, Organizing, Staffing, Directing, Controlling. Organizational Structures: principles of organization, types- formal and informal, line, line & staff, matrix, hybrid, span of control, departmentalization. Decision making- steps in decision making.

UNIT - VI **Marketing and Finance Management** **(06 Hours)**

Team Management, Leadership –Trait theory and charismatic leadership, Qualities of a good leader, Leadership Styles. Introduction to Marketing management: Marketing Mix, concepts of marketing, demand forecasting and methods, market segmentation. Introduction to Financial management, Financial Statements, Profit and Loss Statement (Income Statement), Balance Sheet. Financial Analysis- Profit Analysis. Introduction to Production Management; definitions, objectives, functions, plant layout- types & factors affecting it, plant location- factors affecting it. Introduction to Human Resource Management; definition, objectives of manpower planning, process, sources of recruitment, process of selection. Corporate Social Responsibility and its importance. Business Ethics.

Assignments:
Quiz/ Test / Mini Project / Case Study / Presentations based on syllabus.

Reference Books:

1) R.Paneerselvam, Engineering Economics, PHI publication

2) O.P.Khanna, Industrial engineering and management
3) Robbins S.P. and Decenzo, Fundamentals of Management
4) Tripathy and Reddy, Principles of Management
5) N Gregory Mankiw, Economics: Principles of Economics, Cengage Learning

6) L.M.Prasad, Principles and Practices of Management

7) Dr. K. K. Dewett & M. H. Navalur, Modern Economic Theory, S. Chand Publications

8) P.N. Chopra, Principles of Economics, Kalyani Publishers

Syllabus for Unit Test:

Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

07: PROGRAMMING LABORATORY I

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Practical: 04 Hours / Week	Term Work (Practical): 50 Marks	02 Credits

Course Pre-requisites:

The Students should have

1. Basics concepts of Object Oriented Programming
2. Basic mathematical ability

Course Objectives:

1. At the completion of this course, student is able to read, write, and debug java programs using good programming style.

Course Outcomes:

1. Write java programs using JDK & Solve arithmetic expressions using java program.
2. Gain knowledge & apply concepts of class fundamentals in various programming assignments.
3. Differentiate between String & String Buffer Class. And use different functions of these classes in various programming assignments.
4. Understand and implement the concept of interfaces and packages.
5. Learn the concept of Exception handling and Apply it.
6. Apply the functions of AWT classes in various programming assignments.

UNIT - I **Java Evolution**: Difference between Java , C, C++, Features of java, The java runtime environment (JDK, JVM, Command Line Arguments),Sample java program, Java statements and program structure, Fundamental programming constructs in java**:** (Constants, Variables, keywords, Data Types, Operators, Expressions and control structures) **(06 Hours)**

UNIT - II **Classes and methods**: Specification of a class, Introduction to Methods, Access specifiers, Constructors, Method overloading, this keyword, finalizer method, recursion, Introducing Final keyword , Concept of array, Introducing Nested and Inner Classes, Inheritance , Using Super, Method overriding, Dynamic method Dispatch, Abstract class concept. **(06 Hours)**

UNIT - III **String Handling:** **(06 Hours)**

The String Constructors, String Operations, CharacterExtraction, StringComparison, Modifying a String, String Buffer.

The Collections Framework:

More Utility Classes, Networking, the Applet Class, Event Handling, Collection Interface, List Interface, Set interface, Map Interface , Enumeration Introduction to Swing.

UNIT - IV **Package and Interfaces:** **(06 Hours)**

Introduction to package: Types of packages, User define packages, Use of package keyword, Importing packages.

Interfaces: Define and implement interface, use of interfaces to support multiple inheritance, variables in interfaces, interfaces can be extended.

UNIT - V **Exception Handling and Multithreaded programming:** **(06 Hours)**

Exception handling: Introduction to exception handling, predefined and user defined exceptions.

Use of try, catch, throw, throws and finally keywords.

Introduction to threads, life cycle of a thread, thread states, thread properties, methods in Threads and Runnable, setting priority of threads, synchronization and inter thread communication

UNIT - VI **Introducing the AWT, Using AWT controls, Images:** **(06 Hours)**

Introduction to AWT, events, listeners, event handling methods, a small application to demonstrate use of controls – label, button, check box, text, radio button, Dialog Box, scroll bar, choice controls ,List, Menu bars and Menus layout. Image Fundamentals image Observer, Double Buffering, and ImageProducer.

AWT classes, Frame windows, Creating a Frame Window in an Applet,

Working with graphics, Working with color, Setting the Paint Mode, Working with Fonts, Control Fundamentals,

Term Work:

1. Introduction to Java.
2. Write a program to implement Class and Inheritance Concept.
3. Write a program to differentiate between method overloading and method overriding.
4. Write a program to understand the use of String class and string buffer class
5. Write a program to implement Applet.
6. Write a program to implement the concept of Package.
7. Write a program to implement concept of Exception Handling.
8. Write a program to implement the concept of Multithreaded Programming
9. Write a program to implement Frame and different graphics objects.
10. Write a program to use different controls of AWT classes.

Text Books:

1. E. Balagurusamy, Programming with Java, 3 e, McGraw-Hill Companies.
2. JAVA 7 Programming, Black Book ,Kogent Learning Solutions Inc.

Reference Books:

1. The complete reference Java 2 Third Edition,TMH publication by Patrick Naughton, Herbert Schildt.

2. Ken Arnold, James Gosling, David Holmes, "The Java Programming Language", 3e, Sun Microsystems.

08: ENGINEERING MATHEMATICS – III

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Theory: 03 Hours / Week	End Semester Examination: 60 Marks	04 Credits
Tutorials: 1Hr/Week	Unit Test : 20 Marks	
	Attendance: 10 Marks	
	Assignments: 10 Marks	

Course Pre-requisites:

The Students should have knowledge of

1. Differential calculus
2. Integral calculus.
3. Complex numbers.

Course Objectives:

1. To develop ability to use the mathematical techniques, skills, and tools necessary for engineering practice.

Course Outcomes:

1. Develop mathematical modeling of systems using differential equations and solve linear differential equations with constant coefficient.
2. Evaluate complicated real integrals using basics of analytic functions and the basics in complex integration.
3. Solve problems on Fourier sine and cosine transform and solve difference equation by Z-transform.
4. Apply theorems to compute the Laplace transform, inverse Laplace transforms.
5. Solve system of linear equation and ordinary differential equation by numerical methods.
6. Apply basics of statistics and probability.

UNIT - I Differential Equations: (08 Hours)

Solution Of Linear Differential Equation Of n^{th} Order With Constant Coefficients, Method Of Variation Of Parameters, Cauchy's and Legendre's Linear Equation, Simultaneous Liner Differential Equations, Total Differential Equations, Symmetrical Simultaneous Differential Equations. Applications to Electrical Circuits.

UNIT - II **Complex Variables** **(08 Hours)**

Functions of Complex Variables, Analytic Functions, C-R Equations, Conformal Mapping, Bilinear Transformation, Cauchy's Theorem, Cauchy's Integral Formula, Laurent's Series, Residue Theorem.

UNIT - III **Transforms** **(08Hours)**

Fourier transforms: Fourier Integral Theorem, Fourier Sine And Cosine Integrals. Fourier Transform, Fourier Sine And Cosine Transforms, Inverse Fourier Transforms, Discrete Fourier Transform and its Applications.
Z – Transform: Definition, Properties, Inverse Z- Transform. Applications to difference equation, Relationship between Z- Transform and Fourier Transform.

UNIT - IV **Laplace Transform** **(08 Hours)**

Definition, Properties and Theorems, Inverse Laplace Transform,

Methods of Finding Inverse Laplace Transforms, Laplace Transform of

Unit-step Function. Dirac-Delta Functions, Periodic Functions, Ramp

Functions.

UNIT - V **Numerical Methods** **(08 Hours)**

LU decomposition for systems of linear equations; numerical solutions of non-linear algebraic equations by Secant, Bisection and Newton-Raphson Methods; Numerical integration by trapezoidal and Simpson's rules

UNIT - VI **Statistics and Probability** **(08 Hours)**

Measures of Central Tendency, Standard Deviation, Coefficient of Variation, Moments, Skewness and Kurtosis, Correlation and Regression, Reliability of Regression Estimates.

Theorems and Properties of Probability- Baye's Theorem, Probability Density Function, Discrete, Random and Continuous variables, Probability Distributions: Binomial, Poisson, Normal and Hypergometric; Test of Hypothesis: Chi-Square test.

Stochastic Processes:

Markov Chains, stochastic Matrix.

Term Work:

1)Differential equations.

2) Complex variables.

3)Fourier transform and Z- transform.
4)Laplace transform.

5)Numerical methods.

6) Statistics and Probability.

Text Books:

1. Applied Mathematics (Volumes I and II,III) by P. N. Wartikar & J. N. Wartikar,Pune Vidyarthi Griha Prakashan, Pune.

2. Higher Engineering Mathematics by B. S. Grewal, Khanna Publication, Delhi, 42th edition (2012).

Reference Books:

1. Higher Engineering Mathematics by B.V. Ramana, Tata McGraw-Hill (2008).

2. Advanced Engineering Mathematics by Erwin Kreyszig, Wiley Eastern Ltd, 8th edition(1999).

3. Advanced Engineering Mathematics, 7e, by Peter V. O'Neil, Thomson Learning,6th edition (2007).

4. Advanced Engineering Mathematics, 2e, by M. D. Greenberg, Pearson Education, 2nd edition(2002).

Syllabus for Unit Test:

Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

09: COMPUTER GRAPHICS AND VISUALIZATION

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Theory: 03 Hours / Week	End Semester Examination: 60 Marks	Theory :03 Credits
Practical: 02 Hours / Week	Unit Test: 20 Marks	TW :01 Credit
	Attendence:10 Marks	
	Assignments:10 Marks	
	Term Work (Practical): 50 Marks	
	Total : 150 Marks	

Course Pre-requisites:

The Students should have knowledge of

1. Basics of "C" programming language
2. Basic mathematical ability
3. Basics of GLUT

Course Objectives:

1. To familiarize with the universal concepts of computer Graphics Programming.
2. To provide a comprehensive introduction to computer graphics leading to the ability to understand contemporary terminology, progress, issues, and trends.
3. To introduce computer graphics techniques, focusing on 2D and 3D modeling, image synthesis, and rendering.
4. To provide knowledge of how interdisciplinary nature of computer graphics is emphasized in the wide variety of examples and applications.

Course Outcomes:

1. Apply fundamental concepts and practical skills in computer graphics.
2. Implement and use classic and modern algorithms and data structures in computer graphic to 3-D geometry, 3D modeling and 3D object Representation.
3. Acquire practical skills on additional advanced concepts, e.g. hidden surfaces & lines, curves & fractals.
4. Demonstrate graphics programming skills for different animation techniques & virtual reality.
5. Improve different solid modeling skills.
6. Apply basics of rendering & physical based modeling to image.

UNIT - I **Basics of Computer Graphics:** **(06 Hours)**

Introduction to computer graphics, Graphics Premitives: Raster scan & random scan displays, display processor, display file structure, Display devices, Interactive devices, Data generating devices. line segments, vector generation, DDA and Bresenham's line and circle drawing algorithms, thick lines, character generation methods.

UNIT - II **Polygon:** **(06 Hours)**

Introduction, representation, entering Polygons, Polygon filling: Seed fill, Edge fill, scan conversion algorithm, filling with patterns. Windowing and Clipping Introduction, viewing transforms, 2D clipping, Cohen-Sutherland algorithm, Polygon Clipping, Sutherland-Hodgman algorithm, Generalized clipping

UNIT - III **3-D Geometry:** **(06 Hours)**

2-D Transformation: Basic Transformations, Homogenous coordinates, Rotation about an arbitrary point, coordinate transformation, Inverse transformation, Shear and Reflection transformation.

3-D Transformations: Displays in three dimensions,, 3D transformations & matrix representation, Rotation about an arbitrary axis, Concept of parallel and perspective projections, Viewing parameters, 3D clipping, 3D viewing transformations. Case Study on 3D modeling and 3D object Representation

UNIT - IV **Hidden Surfaces and Lines:** **(06 Hours)**

Back Face removal algorithm,Z-Buffer,Scan Line algorithm, Painter's algorithm,Hdden line methods. Light, Colour and shading: Introduction, Diffused illumination, point source illumination, shading algorithm, reflections, shadows, ray tracing, Color models and tables, shading algorithm, transparency

UNIT - V **Segments and Animation:** **(06 Hours)**

Introduction, The Segment Table, Segment creation, closing a segment, deleting a segment, renaming segment, saving and showing segments,

Computer animation, Morphing, Methods of controlling animation, animation languages and tools. Virtual Reality,Rendering

.

UNIT - VI **Curves and Fractals:** **(06 Hours)**

Curve generation, Interpolation,Interpolation alogorithm,B-splines,Curved surface patches,Beizer curve,fractals,factral line, surfaces,

Term Work:

1. State and discuss on basics of computer graphics.
2. Design and apply the Bresenham's circle & line drawing algorithm using C language.
3. Design and build the DDA circle & line drawing algorithm using C language
4. Design and Illustrate 2D & 3D transformation.
5 Illustrate and construct 3D clipping algorithms.
6. Build shading algorithm using OpenGL.
7. Design and Construct interpolation algorithm using OpenGL.
8. State and discuss on real-time animation techniques.
9. Design a triangle in 3D format with solid model.(Using C with Open GLUT)
10. Illustrate to Render any 3D object using OpenGL.

Text Books:

2. Apurva A Desai,"Computer Graphics",PHI Learning Pvt. Ltd.,2010
3. Donald Hearn & M. Pauline Baker, "Computer Graphics C version", 2nd Ed, Pearson Education
3. David F. Rogers, "Procedural Elements for Computer Graphics", 2nd Ed – Tata McGraw Hill Edition.
4 Tomas Moller and Eric Haines Real-Time Rendering A K Peters Ltd, 2nd edition, 2002
5 Alan H. Watt and Mark Watt, Advanced Animation and Rendering Techniques : Theory and Practice, Addison-Wesley, 1992
6. Matt Pharr and Greg Humphreys, Physically based rendering, Morgan Kaufmann,

7. James D. Foley, Andries van Dam, Steven K. Feiner andJohn F. Hughes, Computer Graphics : Principles & Practices, Addison Wesley, 2nd edition in C

Reference Books:

1. M.N. Sinha, A.D.Udai, “Computer Graphics”, Tata McGraw Hill Edition.
2. Foley, Dam, Feiner, Hughes,” Computer Graphics Principles & Practice”, 2nd Ed, Pearson Education.
3. Hill, Kelly, “Computer Graphics using OpenGL”, 3rd Ed, Eastern Economy Edition.

Syllabus for Unit Test:

Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

10: SYSTEM PROGRAMMING

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Theory: 03 Hours / Week	End Semester Examination: 60 Marks	Theory:03 Credits
Practical: 02 Hours / Week	Unit Test Tests: 20 Marks	TW :01 Credit
	Attendence:10 Marks	
	Assignments:10 Marks	
	Term Work +Oral: 50Marks	

Course Pre-requisites:

The Students should have knowledge of

1. Knowledge of Microprocessor concepts and Assembly language

Course Objectives:

1. To help the students understand functioning of various system programs

2. To initiate an understanding of design of language translators and brief about phases of compilers and other

3. To provide a theoretical framework for optimizing the code.

4. To brief the students about operating system concepts

Course Outcomes:

1. Understand theoretical and practical aspects of language translation.

2. Understand and show working and design of assemblers and microprocessors

3. Understand the concept of memory allocation, relocation along with the functions of loaders linkers and use various types of loaders.

4. Gain knowledge about phases of compiler and show it's working.

5. Gain knowledge of various operating system concepts and shell scripting.

6. Understand the concept and use of various device drivers

UNIT - I System Software and Assemblers: (06 Hours)

System software concepts, assembler basics, system software Components, Language translators, Language translation fundamentals Machine structure, Elements of Assembly language programming., Structure of an assembler, Design of single and two pass assembler

UNIT - II **Macro processor** **(06 Hours)**

Macro language and macro processor, macro instructions, features of macro facility, macro instruction arguments, conditional macro expansion, macro call within macros, macros instructions defining macros, Macroprocessor design

UNIT - III **Linkers and Loaders:** **(06 Hours)**

Loader scheme, absolute loaders, subroutine linkages, relocating loaders, direct linking loaders, other loader schemes Binders, linking loaders, Overlays, Dynamic Binders, Design of an absolute Loaders, Design of a Direct –Linking loaders. Dynamic Link Libraries.

UNIT - IV **Compiler:** **(06 Hours)**

Basic Compiler Function Compiler phases - Lexical Analysis: Role of a Lexical analyzer, input buffering, specification and recognition of tokens, Designing a lexical analyzer generator, Syntax Analysis: Role of Parser, Top-down parsing, Recursive descent and predictive parsers (LL), Bottom-Up parsing, Operator precedence parsing, LR, SLR and LALR parsers. Intermediate code generation three address code intermediate code forms,. Compiler generation tools –LEX and YACC. Interpreters. Case study: Java Compiler,JIT Compiler, Concurrent Compiler, embedded Compiler.

UNIT – V **Operating system:-** **(06 Hours)**

system concept, Operating system structure.O. S. Components, O.S. Services, System calls. Shell scripting Shell scripting (Bourne Shell (SH), Bourne-Again Shell (BASH), C-Shell (CSH), TCSH, Korn Shell (KSH))Shell commands (Basics, Pipelining, Background/Foreground, File Permissions, etc.) AWK Programing, Process control (ps,jobs, kill,bg,fg,fork,spawn,wait,pipe,socket)

UNIT - VI **Unix Device Drivers:** **(06 Hours)**

Definition, Anatomy and types, Device Programming, Installation and Incorporation of driver routines, Basic device driver operation, Implementation with Line printer, Comparative study between device drivers for Unix and Windows.

Term Work:

The sample practical assignments are given below. This can be used as a guideline and course coordinator can recommend the list of practical assignments.

1. Design and Build a single pass assembler.

2.Design and Build a two pass assembler.

3.Design and Build a two pass Macro processor

4.Illustrate use of DLLs.

5. Design and apply lexical analyzer using Lex Compiler.

6. Devise some programs using Shell Programming.

7. Illustrate and discuss use of various device drivers.

Text Books:

1. System Programming by John J. Donovan, TATA McGRAW-HILL Edition.
2.System Programming by Leland Beck, Pearson Ed.
3.D. M. Dhamdere : "Systems programming and operating system", Tata McGraw Hill
4. Unix device drives by George Pajani, Pearson Education.
5. Bash Pocket Reference (Pocket Reference (O'Reilly))

Reference Books:

Unix programming Environment- Keringham and Pike, Pearson Education

Syllabus for Unit Test:

Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

11: FUNDAMENTALS OF SOFTWARE ENGINEERING

TEACHING SCHEME:	**EXAMINATION SCHEME:**	**CREDITS ALLOTTED:**
Theory: 03 Hours / Week	End Semester Examination: 60 Marks	04 Credits
	Unit Test Tests: 20 Marks	
	Assignment :10 Marks	
	Attendance: 10 Marks	

Course Pre-requisites:

The Students should have

1. programming paradigms

2. Basic mathematical ability

Course Objectives:

1. To introduce software engineering and its grandness.
2. To understand the process of developing new technology and the role of experimentation.
3. To introduce ethical and professional issues and to explain why they are of concern to software engineers.
4. Analyze, classify the requirements and design the software.
5. Demonstrate expertise in problem solving in the design, development, validation, evolution and sustainment of (software) products.

Course Outcomes:

I. Recognize Distinguish Software engineering process models and describe specifications of the software to be developed or modified.
II. Analyze, classify the requirements and design the software.
III. Design and develop software qualitatively.
IV. Analyze, classify, select software development process to develop, and maintain software systems that behave reliably and efficiently.
V. Demonstrate expertise in problem solving in the design, development, validation,

evolution and sustainment of (software) products.

VI. Apply the techniques, skills, and modern engineering tools as Rational rose and Star UML etc. necessary for designing and constructing software systems

UNIT - I **Introduction to Software Engineering** **(06 Hours)**

Defining Software, What & Why Software Engineering?Difference between software and hardware, software engineering – A layered approach, Software Application Domains, Software Myths.

Process Models – Software process Framework, Process activities, Defining Framework Activity? Identifying a Task Set, Process Patterns, Traditional software development process model approach - Linear Framework model,Iterative Framework Model, Parallel Framework model,and Component based Model, Object oriented software development approach.

UNIT - II **Software Specification** **(06 Hours)**

What is requirement engineering, Requirement Elicitation and Analysis Process, Elicitation Techniques, Requirement Specification, Functional requirements and Non-Functional Requirements, Drafting Software Requirement Specification?

Requirement Analysis - Domain Analysis, Object Oriented Analysis, Requirement Modelling, Data modelling, and Flow oriented modelling, Functional Modelling, Process specification, CASE tools.

UNIT - III **Software Evolution** **(06 Hours)**

System Engineering Hierarchy, Information Engineering, Product Engineering, Introduction to Business area analysis, CASE Tools in software design.

Software Design Process, Design model – Data Design model, Architecture Design model, Transform and Transaction Flow, Interface design Flow, Component Level and Deployment level design elements.

Design Concepts – Abstraction, Architecture, Patterns, Modularity,Functional Independence, Refinement, Refactoring, Object-

Oriented Design Concepts.

UNIT - IV **Software Evaluation** **(06 Hours)**

Introduction to Software testing, Bugs, Defects and Errors, Internal and External view of Software testing, Types of Testing – White Box – Basis path testing, Control Structure testing, Black Box, Grey Box testing, Verification and Validation Model, Unit Testing, Integration Testing, System Testing, Strategic issues, Testing Strategy for OOPS .

Debugging – Debugging process, Debugging Strategies, Correcting Errors

UNIT - V **Software Quality Assurance (SQA)** **(06 Hours)**

Software Quality and Metrics, Quality Standards, Reviews and Inspection, Software Measurement and metrics, Elements of SQA, SQA tasks, Goals and Metrics, Formal approaches to SQA, SQA Plan, and Software Reliability.

Software Configuration Management – Elements of SCM, Baselines, Software Configuration Items, SCM Features, the SCM process.

UNIT - VI **Project Planning and Management** **(06 Hours)**

The management Spectrum – People, Product, Process, Project. Project Planning process, Process Metrics, Software Scope and Feasibility study, Project Scheduling, Software Project Estimation, Effort estimation model, the make-buy Decision, Outsourcing,

Risk management – Software Risks, Risk identification, Risk projection, Risk Refinement, RMMM plan.

CLASS ASSIGNMENTS –Guidelines

1. The Class Assignments with respect to this subject might be conducted using these tools (either one tool or combination):-
    a. Asking each student to give one presentation on one topic related to this syllabus.
    b. Conducting six Multiple choice question online test on each unit each test of 10 marks and then average out

c. Asking students to prepare a report based on their understanding by viewing the NPTEL videos of this subject.
d. Asking the students to perform these Assignments:-
    i. Suggest Which SDLC model will be used to develop ATM software. Justify?
    ii. Develop Requirement Specification for ATM Software.
    iii. Design the Class Diagram and Use case Diagram for ATM software.
    iv. Discuss on Automated Software Testing. Create Test cases for Functionality of ATM software using a Test Tool (Test Link).
    v. Discuss and Prepare IEEE Quality Document for ATM software.
    vi. Prepare a Gantt chart using MS Project CASE Tool for a small Project.

Text Books:

ROGER PRESSMAN - A Practitioner's Approach", 4th Ed., Tata McGraw Hill Publication Company.

Software Engineering.", Sommerville, 9th Edition, Addison Wesley, 2010

Reference Books:

1.ROGER PRESSMAN - A Practitioner's Approach"

2.Martin Fowler

3.Grady Booch

4.Rambaugh

5.Pfleeger S. L., "Software Engineering".

Syllabus for Unit Test:

Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

12: MICROPROCESSOR AND MICROCONTROLLER

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Theory: 03 Hours / Week	End Semester Examination: 60 Marks	04 Credits
Practical: 02 Hours / Week	Unit Test Tests: 20 Marks	
	Practical + Term Work: 50Marks marks	

Course Pre-requisites:

The Students should have

1. Binary number system, Boolean algebra , Combinational and sequential circuits and memory.

Course Objectives:

1. To develop an understanding of the architecture and functions of microprocessors and microcontrollers.

2. To learn machine language programming & interfacing techniques.

Course Outcomes:

1. Describe microprocessor and micro controller architecture.

2. Understand programmer's model of 80386.

3. Understand concepts of segmentation and paging

4.. Comprehend hardware and software interaction and integration.

5. Design microcontroller based systems.

6. Write assembly language program using 32 bit registers.

UNIT - I **Introduction to 8086** **(06 Hours)**

Concepts of architecture of 8086 microprocessor and segmentation, 80386 DX architecture, Registers, Salient features of 80386 DX, Signal definition, Addressing modes, Instruction format, Instruction pipelining in 80386.

UNIT - II **Real and protected mode** **(06 Hours)**

Real mode programming model, Memory addressing in real mode, Interrupt handling and exceptions, Switching between real and protected mode, protected mode register model, segment translation, segment descriptors, paging

UNIT - III I/O interface **(06 Hours)**

Programmable peripheral devices and interfacing, Interfacing with PPI 8255,PIC 8259, USART 8251, PIT 8254, DMAC 8237, Block diagram, operating modes and control word formats.

Case study- I/O hub.

UNIT - IV **Multicore Architecture** **(06 Hours)**

Intel 64 bit architecture, Pentium processor functional block diagram, memory management, Multicore Architecture, Bus Connections, core to duo and dual core processors, characteristics and design guidelines.

.**Case study:- i5/i7**

UNIT - V Introduction to 8051 microcontroller **(06 Hours)**

Comparison of microprocessor and micro controller, Features of 8051, pin definition, 8051 architecture, Register set, memory organization, Timers and counters, serial port, Interrupt structure. Addressing modes, instruction set

UNIT - VI Programming and interfacing of 8051 **(06 Hours)**

Counter and timer programming, interrupt programming, serial communication programming, Interfacing keyboard and Display. External memory interface, stepper motor interface.

Contemporary processor and controller survey.

Term Work:

List of assignments

1) Design and build an Assembly language program for multiplication of two 16 bit numbers using 8086 microprocessor.

2) Design and build an ALP to count no. of positive and negative numbers from the array

3) Design and build an 8086 ALP to check whether the string is palindrome or not
4) Design and build an program to arrange given set of numbers in Ascending/Descending order.
5) Design and build an Assembly language program to convert Input hexadecimal to BCD Number.

6) Design and build an ALP to program to use GDTR, LDTR and IDTR in Real Mode.

7) Design and build an program to switch between real mode and protected mode

8) Design and build an Assembly language program to display current time from system.

9) Design and build an Assembly language program to interface 8051 Microcontroller with Keyboard and display.

10) Design and build an Assembly language program to interface 8051 Microcontroller with stepper motor.

Text Books:

1.Muhammad Ali Mazidi and Janice Gillispie Mazidi, " The 8051 Microcontroller and embedded systems", 2009, Pearson education

2. *Krishna Kant "Microprocessors And Microcontrollers Architecture, Programming And System Design 8085, 8086, 8051, 8096" PHI*

3. 80386 Microprocessor Handbook, Chris H. Pappas, William H. Murray

Reference Books:

1. intel microprocessor and peripheral handbook(32 bit) 80386 DX

2. D.V.Hall, "Micro Processor and Interfacing ", Tata McGraw-Hill.

3.Microcomputer Systems: The 8086/8088 Family: Architecture, Programming and Design, 2nd ed.,Liu & Gibson

4. Intel 64 and IA-32 bit architectures Software Developer's Manual, Volume 3A, Intel, (Digital Content PDF: 253668.pdf)

Syllabus for Unit Test:

Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI

14: PROGRAMMING LABORATORY II

TEACHING SCHEME:	EXAMINATION SCHEME:	CREDITS ALLOTTED:
Practical: 04 Hours / Week	Term Work (Practical): 50 Marks	02 Credits

Course Pre-requisites:

The Students should have

1. Basics concepts of Object Oriented Programming
2. "Java" programming language (Core and Advanced Java)

Course Objectives:

1. To provide an insight of Internet programming and how to designand implement complete applications over the web.
2. To provide hands-on experience of the recent platform, technologiesand design Methodologies used in developing web Applications.

Course Outcomes:

1. Develop WEB 2.0 Rich Internet Applications using thehierarchy of objects in HTML and XML.
2. Design dynamic and interactive web pages using HTML and Ajax performing client validation using Java Script.
3. Use ontology and inference engines in semantic web development.
4. Develop full-fledged Enterprise Applications
5. Implement enterprise beans and understand its benefits.
6. Develop Web services using SOAP .

UNIT - I Introduction to WEB 2.0 Rich Internet Applications: (08 Hours)

Introduction: From Browsers to Rich Clients – browser drawbacks, A solution – rich clients, Rich clients today. HTML 5:Detecting HTML 5 features – Canvas, video, local storage, web workers, offline Applications , geo location, placeholders, input types, doc type, root, headers, articles, dates and times, navigation and footers. Introduction to PHP, Basic rules of PHP program, JSF, The WEB Model and XML,

XPATH and XSLT .

UNIT - II **AJAX-I:** **(08 Hours)**

Java Script Fundamentals, Objects in Java Script, Dynamic HTML with Java Script, ASP, Basic communication techniques –AJAX with images, Dynamic script loading, AJAX libraries – JQuery, JSON, JSON versus XML, server-side JSON tools.

UNIT - III **Semantic Web Technologies:** **(08 Hours)**

Introduction to Semantic Web, Web 3.0 and Semantic Web; why Semantic Web; Impact of Semantic Web; Myths about Semantic Web; Ontologies: Introduction to Ontology; Types of Ontologies, Basic OWL; Class, Properties and Constraints; Ontology development methodology; Ontology tools- SPARQL, Search Engine Optimization(SEO).

Applications of Semantic Web: Software Agents; Semantic Search; Semantic Web Services; Semantics in Social Networking; SOA, ETL; Web crawling, Page Ranking Algorithm.

UNIT - IV **Enterprise JAVA (J2EE):** **(08 Hours)**

Defining the Enterprise, Introducing Enterprise Applications, Creating dynamic content with servlets, using Java server pages(JSP), NetBeans, interacting with relational databases using JDBC,MVC Architecture, JMS, Managing transactions with JTA/JTS, security aspects in system architecture, J2EE design patterns.

UNIT - V **Enterprise Beans:** **(08 Hours)**

Enterprise Bean, Benefits of Enterprise Beans ,When to Use Enterprise Beans, Types of Enterprise Beans - Session Bean, Message-Driven Bean , Contents of an Enterprise Bean ,Packaging Enterprise Beans in EJB JAR Modules ,Naming Conventions for Enterprise Beans ,The Lifecycles of Enterprise Beans - Stateful Session Bean , Stateless Session Bean, Creating the Enterprise Bean . Coding the Enterprise Bean Class.

UNIT - VI **Web services:** **(08 Hours)**

Introduction to Service Oriented Architecture, Combining protocols to build Web services – REST Services, REST – resources, representations, state, transfer – using HTTP methods. Web services using SOAP and WSDL.

Term Work:

1. Design the static web pages required for a website using HTML 5.

2. Illustrate XML document processing in Java using XPath and XSLT.

3. Illustrate the use of Java Script in performing client side validation.

4. Describe and Build Dynamic web Pages using DHTML with Java Script.

5. Construct small applications using AJAX

6. Design and build small applications usingJQuery, JSON and AJAX.

7. Outline and Discuss on Applications of Sematic Web Technologies.

8. Report how to use OWL to develop Ontologies.

9. Construct a Web Crawler

10. Outline and Discuss on implementation of Page Ranking Algorithm

11. Build and Illustrate an Enterprise Applications

12. Build and Apply Web Services using SOAP

Text Books:

1. Eric Van Der Danny Ayers et al,"Professional Web 2.0 Programming", Wrox Publications, 2007
2. Web Technologies: Black Book, Kogent Learning Solutions Inc.Wiley India Pvt. Ltd.2006
3. David Hunter et al , "Beginning XML", 4th Edition, Wrox/John Wiley, 2007
4. Mark Pilgrim "HTML 5 Up and Running", O'REILLY| GOOGLE Press, 2010.
5. Nicholas C Zakas et al ,"Professional AJAX", 2nd Edition, Wrox publications,2007.
6. Thomas Erl ,"SOA: Concepts, Technology and Design", Pearson, 2005
7. Karin K. Breitman, Marco Antonio Casanova and Walter Truszkowski" Semantic Web: Concepts, Technologies and Applications", Springer International Edition, 2007.
8. Justin Couch and Daniel Steinberg, Hungry Minds Inc, "Java 2 Enterprise Edition Bible" 2002.

Reference Books:

1.Lee W. Lacy ,OWL: Representing Information Using the Web Ontology Language, Trafford Publishing, 2005.

2. Christopher D. Manning, PrabhakarRaghavan&HinrichSchutze,Introduction to Information Retrieval, Cambridge university press, 2008

Syllabus for Unit Test:

Unit Test -1	UNIT – I, UNIT – II, UNIT - III
Unit Test -2	UNIT – IV, UNIT – V, UNIT - VI