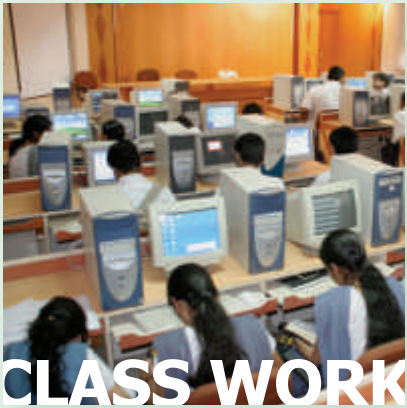
BHARATI VIDYAPEETH UNIVERSITY,
Pune.

(Established under Section 3 of UGC ACT 1956)

COURSE STRUCTURE AND SYLLABUS

B. Tech. (COMPUTER)
(Sem. III & IV)



COURSE STRUCTURE & SYLLABUS

BHARATI VIDYAPEETH UNIVERSITY, PUNE

B. Tech. (COMPUTER) (Sem. III & IV)

HIGHLIGHTS

Bharati Vidyapeeth University College of Engineering (BVUCOE) is the largest Engineering College in Maharashtra with an intake of 700 students in each academic year. Imparting quality technical education from Under Graduate to Doctorate Level, BVUCOE is probably the only Engineering College in India with an accreditation from both NAAC as well as NBA. The faculty at BVUCOE boasts of highly qualified academicians, a quality that is further emphasized by the fact that 15 of them are presently pursuing their Ph.D. degree.

BVUCOE has been ranked 29th amongst the Top 50 Technical Schools of India in survey conducted by DATAQUEST-IDC. We have enjoyed a ranking in this list for the last 4 years. Research is of utmost importance in all our programs. A total of 113 research papers were published in the academic year 2007-2008.

Currently we have 12 ongoing research projects. The infrastructure of BVUCOE is state-of-the-art with 62 classrooms, 59 laboratories and a well-stocked library that currently holds 27,130 titles. The college has an international presence with MoUs signed with the North Carolina A&T State University (Greensboro, USA), University of Venice (Italy), Actel Corporation (USA). Corporate interaction is also inculcated in our programs through our association with Oracle India Ltd., Infosys Ltd. and Tata Consultancy Services.

SALIENT FEATURES

The field of engineering reflects the technological dynamism present in today's world. The department an under-graduate programme viz. B.Tech. (Comp) and a post-graduate programme viz. M.Tech. (Comp). The department has incorporated all the latest facilities for the benefit of the students. The department has 8 well-equipped laboratories, with three servers. The latest software and hardware equipments are provided to the students. The department has specialized laboratories in Digital Signal Processing, Multimedia Techniques, Linux and Software Engineering.

The Association of Computer & Information Technology Engineering Students (ACIES) organizes different events, guest lectures for the students. The syllabi of the department are revised regularly so as to match the needs of the industry. Apart from giving thorough technical knowledge using the state-of-art technology, the students are taught communication skills and are given experience in working in groups on live projects.

MAJOR GROUPS/ AREAS

Operating Systems, Multimedia, Image Processing, Computer Networks, Software Engineering, System Programming

EXPERTISE IN RESEARCH AND CONSULTANCY

The department of Computer Engineering has received fund from AICTE for Modernization of Research Laboratory "Object Oriented Modeling and Design".

ON GOING RESEARCH PROJECTS

Extended Log Structural File System For Linux Operating System, Platform Independent File Transfer, Block based Image Processing, Process Based Generic Modeling at Real Time Complex System with specific reference to Visual Modeling, DOUT – Distributed Opportunistic Unit Testing

COMPLETED PROJECTS

Visual Modeling of Real Time System, NeTailor- A Network Patch Management Solution, Voice Message Transform, Artillery Command Post Execution Software, MAFCOG 1.0 Mathematical Formula Analysis and Generator, Object Oriented Learning Environment Using ASP, Real Time Complex System, Implementation of Sniffers.

MAJOR EQUIPMENTS

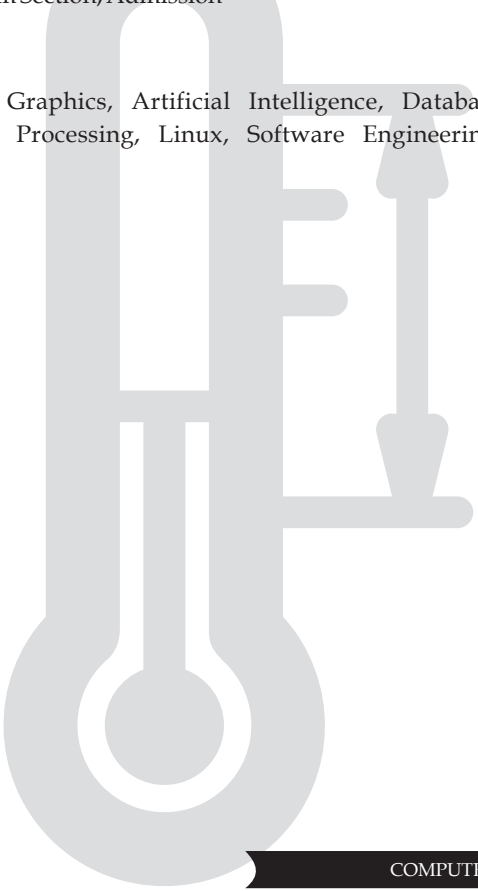
Pentium -I 120/150 MHz - 25, Pentium - III 550 MHz - 10, Pentium -III 933 MHz - 68, Pentium - IV 2.46 GHz - 94, Pentium - IV 1.7 GHz - 10, Pentium - IV (IBM) 2.8 GHz - 100.

SOFTWARES

Operating Systems	:	MS-DOS, Windows 95, Windows 98, SCO Xenix 2.1, Linux 7.0, Microsoft OS/2 Sdk Ver 1.02, Sun Solaris 7.1
RDBMS	:	Oracle 8, Oracle 8i, Oracle 9i, SQL Ver 7.0 & 8.0
Developing Softwares	:	Visual Studio 6.0, Microsoft Office-2000, Turbo C + + For DOS 4.5, Microsoft C 6.0, Microsoft Fortran, Turbo Pascal, Microsoft COBOL, Turbo C, Visual Studio MS.Net, Developer 2000, MS Project 2003
Web Designing Softwares	:	Adobe Photoshop, PageMaker, Corel Draw
Customized Softwares	:	Payroll, Stores/Purchase, Library/Libsys, Student, Exam Section, Admission

LABORATORIES

Information Technology, Computer Graphics, Artificial Intelligence, Database Management System, Digital Signal Processing, Linux, Software Engineering, Microprocessor



STRUCTURE & EXAMINATION PATTERN

B. Tech. - Computer Engineering

Semester III

Total Duration : 32Hrs/Week
Total Marks : 750

Subject Code	Subject	Teaching Scheme (Hrs/Week)			Examination Scheme (Marks)				Total (Marks)
		L	P	T	Theory	Unit Test	TW & Pr	TW & Or	
K70201	Engineering Mathematics - III	04	-	-	80	20	-	-	100
K30202	Algorithms and Data Structures	04	02	-	80	20	50	-	150
K50203	Digital Logic Techniques	04	02	-	80	20	-	50	150
K30204	Discrete Mathematics	04	02	-	80	20	50	-	150
K30205	Internet Programing	04	-	-	80	20	-	-	100
K30206	Programing Laboratory – I	02	02	02	-	-	50	50	100
	Total	**22**	**08**	**02**	**400**	**100**	**150**	**100**	**750**

Teaching Scheme			Examination Scheme				Total
Lectures	Practical	Tutorial	Theory	Unit Test	T. W. & Pr.	T. W. & Or.	
22	08	02	400	100	150	100	750

Semester IV

Total Duration : 32Hrs/Week
Total Marks : 750

Subject Code	Subject	Teaching Scheme (Hrs/Week)			Examination Scheme (Marks)				Total (Marks)
		L	P	T	Theory	Unit Test	TW & Pr	TW & Or	
K70207	Industrial Management	04	-	-	80	20	-	-	100
K30208	Data Communication Systems	04	-	-	80	20	-	-	100
K30209	Advanced Data Structures	04	02	-	80	20	50	-	150
K30210	Digital Signal Processing Tech.	04	02	-	80	20	-	50	150
K30211	Techniques of Microprocessor Programing	04	02	-	80	20	50	-	150
K30212	Programing Laboratory – II	02	02	02	-	-	50	50	100
	Total	**22**	**08**	**02**	**400**	**100**	**150**	**100**	**750**

Teaching Scheme			Examination Scheme				Total
Lectures	Practical	Tutorial	Theory	Unit Test	T. W. & Pr.	T. W. & Or.	
22	08	02	400	100	150	100	750

RULES FOR CONDUCTING TESTS

Mode of the test

In each semester for each subject three tests shall be conducted. The schedule for the same will be declared at the commencement of academic year in the academic calendar.

Each test shall carry 20 marks.

University examination pattern has given weightage of 20 marks for the tests.

To calculate these marks following procedure is followed:

i) Out of the three tests conducted during the semester, the marks of only two tests in which the candidate has shown his/her best performance shall be considered, to decide the provisional marks in each subject.

ii) Average marks obtained in two tests in which students have performed well, shall be considered as provisional marks obtained by the student in the tests.

iii) If the candidate appears only for two tests conducted during the semester, he/ she will not be given benefit of the best performance in the tests.

iv) If the candidate appears only for one test conducted during the semester, to calculate the marks obtained in the tests it will be considered that the candidate has got 0 (zero) marks in other tests.

v) The provisional marks obtained by the candidate in class tests should reflect as proportional to theory marks. In cases of disparity of more than 15% it will be scaled down accordingly; These marks will be final marks obtained by the student. No scaling up is permitted.

vi) If the candidate is absent for theory examination or fails in theory examination his final marks for tests of that subject will not be declared. After the candidate clears the theory, the provisional marks will be finalized as above.

Paper Pattern for Tests

i) All questions will be compulsory with weightage as following

Question 1	-	7 marks
Question 2	-	7 marks
Question 3	-	6 Marks

ii) There will not be any sub-questions.

For granting the term it is mandatory to appear for all the three tests conducted in each semester.

Roll numbers allotted to the students shall be the examination numbers for the tests.

SEMESTER - III

K70201: ENGINEERING MATHEMATICS – III

TEACHING SCHEME
Lectures : 04 Hrs/Week

EXAMINATION SCHEME
Theory : 80 Marks
Duration : 03 Hours
Unit Test : 20 Marks

Unit-I (08 Hours)

Differential Equations:

Solution Of Linear Differential Equation Of Nth 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 (09 Hours)

Complex Variables:

Function Of Complex Variables, Analytic Function, Cauchy-Riemann Equations. Conformal Mapping, Bilinear Transformation, Residue theorem, Cauchy's Integral Theorem and Cauchy's Integral Formula.

Unit-III (09 Hours)

Transforms:

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 (09 Hours)

Laplace Transform:

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, Error Function, First order Bessel's function, Si(t), Ci(t), Ei(t).

Applications to Solution of Linear Differential Equations.

Unit-V (09 Hours)

Vector Differentiation:

Vector Differentiation, Gradient, Divergence and Curl, Directional Derivative, Vector Identities, Irrotational and Solenoidal Vector Fields.

Unit-VI (09 Hours)

Vector Integration:

Line Integral, Surface Integral and Volume integral, Workdone, Gauss-Divergence Theorem, Stoke's theorem and Green's Lemma, Applications to Electromagnetic fields.

Text Books / References

Peter V. O'Neil, Advanced Engineering Mathematics, 5e, Thomson Learning

Erwin Kreyszing, Advanced Engineering Mathematics, Wiley Eastern Ltd.

Wylie C. R. and Barrett L. C., Advanced Engineering Mathematics, McGraw-Hill.

M.D. Greenberg, Advanced Engineering Mathematics, 2e, Person Education

B. S. Grewal, Higher Engineering Mathematics, Khanna Publications, Delhi

P.N. Wartikar and J.N. Wartikar, Applied Mathematics (Volume I & II), Pune Vidyarthi Griha Prakashan

Laplace Transforms by Murray R. Spiegel, Schaum's Outline Series – International Edition

Syllabus for Unit Test

Unit Test 1	Unit I & II
Unit Test 2	Unit III & IV
Unit Test 3	Unit V & VI

K30202: ALGORITHMS AND DATA STRUCTURES

TEACHING SCHEME		EXAMINATION SCHEME	
Lectures	: 04 Hrs/Week	Theory	: 80 Marks
Practical	: 02 Hrs/Week	Duration	: 03 Hours
		Unit Test	: 20 Marks
		T. W. & Pr.	: 50 Marks

Unit –I (06 Hours)

Introduction To Data Structures:

Concept Of Data, Data types, Data Object, Data Structure, Abstract Data Type and Realization of ADT in C. (Class Concept Only).

Unit-II (10 Hours)

Stacks:

Fundamental Concept of Stacks and Queues, ADT of Stack and Queues. Data Structure, Basic Operations on Stacks and Queues, Disadvantages and Applications, Implementation of Stacks, Linear Queue, Circular Queue using Sequential Organization.

Application of Stack: Polish Notation (Infix, Postfix, Prefix), Evaluation of Prefix and Postfix Expression, Inter Conversion of Infix, Prefix and Postfix Expression. Use of Stack by Function Call and Recursive Function Call, Parenthesis Matching, Towers of Hanoi, Application Of Queues.

(08 Hours)

Unit-III

Linear Data Structures Using Sequential Organization:

Concept of Sequential Organization, Concept of Linear and Non Linear Data Structures, Arrays as ADT, Storage Representations, Concept of Ordered List and Polynomial Representation Using Arrays. Representation of Sparse Matrix Using Arrays And Using Linked list, Algorithm for Sparse Matrix Addition, Transpose, Time And Space Complexity Analysis for Simple and Fast Transpose for Sparse Matrix.

(08 Hours)

Unit-IV

Linear Data Structures Using Linked Organization:

Concept of Linked Organization, Single Linked List, Double Linked List, Circular Linked List, Insertion, Deletion and Traversal on Above Data

Structures. Representation and Manipulations of Polynomials using Linked Lists. Representation of Polynomial Using Generalized Linked List.

(10 Hours)

Unit-V

Algorithm Analysis: Definition and Characteristics of an Algorithm, Running Time of a Program (Frequency Count), Time and Space Complexity, Big O Notation, Graphical Representation of Time Complexities.

Searching: Algorithmic Notation, Importance of Searching, Sequential Search, Efficiency Of Sequential Searching, Searching an Ordered Table, Indexed Sequential Search Binary Search, Analysis for the Algorithm.

(06 Hours)

Unit-VI

Sorting:

Bubble Sort, Selection Sort, Quick Sort, Heap Sort, Shell Sort, Insertion Sort, Merge Sort, Radix Sort, Analysis for Best, Worst Cases And Average Case.

PRACTICAL ASSIGNMENTS SCHEME

ALGORITHMS AND DATA STRUCTURES

Concerned staff member is directed to frame 2 To 3 assignments on each Unit

Text Books / References

Ellis Howoritz, Sartaj Sahani, Data Structures, Galgotia Publications

Yedidyah Langsam, Moshe J. Augenstein, Aaron M. Tanenbaum – Data Structures Using C And C++, Prentice- Hall

Loudon, Mastering Alogirithms with C, Oreilly

Alfred V. Aho, John E. Hopcroft, and Jeffery D. Ullman – Data Structures And Algorithms, Addison-Wesley

Richard F. Gilberg and Behrouz A. Forouzan – Data Structures, Brooks, Cole Pub.

Seymour Libschutz, Data structures, Schaum's outline series, Tata Mc Graw Hill

Syllabus for Unit Test

Unit Test 1	Unit I & II
Unit Test 2	Unit III & IV
Unit Test 3	Unit V & VI

K50203: DIGITAL LOGIC TECHNIQUES

TEACHING SCHEME		EXAMINATION SCHEME	
Lectures	: 04 Hrs/Week	Theory	: 80 Marks
Practical	: 02 Hrs/Week	Duration	: 03 Hours
		Unit Test	: 20 Marks
		T. W. & Or.	: 50 Marks

Unit -I (09 Hours)

Number Systems, Algebra Of Logical Variables:

Number Systems: Number Systems, Binary, Octal, Hexadecimal, Conversion Methods, Binary Addition and Subtraction, 1's & 2's Complement Method.

Algebra Of Logical Variables: Review of Boolean Algebraic Theorems, Realization of Boolean Functions and Sufficiency of NAND/NOR for Implementation Standard SOP and POS Forms of Logical Functions, Minimization Techniques K-MAP and Quine McCluskey Method.

Unit –II (09 Hours)

Logic Families and Design Of Combinational Logic Circuits:

Logic Families: Logic Families TTL NAND Gate, Specifications, Tristate TTL, Bus Organized Computer Principal, ECL, MOS, CMOS Families And their Interfacing In Details.

Combinational Logic Circuits: Half adders/subtractors. Full adder/subtractor, Unsigned and Signed Number Representation, N Bit Parallel Adder, subtractor With Look Ahead Carry, BCD Adder, Subtractor Using 7483, 74181 ALU, Code Converter, Binary, BCD, EXCESS 3, Gray, Parity Generator, Checker, MUX DEMUX Encoders, Implementation of Boolean Functions Using MUX, DEMUX BCD to 7 Segment Decoder Driver.

Unit-III (06 Hours)

Flip Flops, Registers, Counters:

One Bit Latch Using NOR/NAND, S-R Flip-Flop, Clocked S-R FF, J-K FF Race Around Condition M/S J-K FF, D FF, Shift Registers SISO, SIPO, PIPO, PISO, Applications of Shift Registers, Ripple Counters, Synchronous Counter ICS like 7490, 7492, 74161, 74191, Functional Block Diagram of Frequency Counter.

Unit-IV (08 Hours)

Memories:

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 (08 Hours)

Sequential Circuits:

Block Diagram, State Variables and Excitation Variables, State Diagram Representation, Moore and Mealy Circuits, Design of Sequence Generator And Sequence Detector, Elimination of Redundant States, Avoiding Lockouts, Fundamental Mode Sequential Circuits Elimination of Critical Races, Hazards, Pulse Mode Sequential Circuits.

Unit-VI (09 Hours)

Algorithmic State Machines: ASM Charts Notations, Design of Simple Controller, Multiplexed Controller Method, RTL Notations, and Implementation.

Programmable Logic Devices: Programmable Logic Elements And Array Logic, Implementation of Combinational and Sequential Logic Design using PLA, PAL, Introduction to FPGA.

List of Practicals

Implementation of Boolean functions using logic gates.

Study of characteristics of typical 74 TTL / 74 CMOS Family like: fan in, fan out standard load, noise margin & interfacing with other families.

Half, Full Adder and subtractor using gates and IC's.

Code conversion using digital IC's.

2 bit digital computer and ALU verification.

Function implementation using Multiplexer and Demultiplexer.

Sequence generator using MSJK flip flop IC's.

Study of counters: Ripple, Synchronous, Ring, Johnson, Up-down counter and its application.

Study of shift registers: Shift left, Shift right, parallel loading and Pulse Train generator.

BCD Adder / Subtractor with Decoder driver and 7 segment display.

Study of typical RAM IC.

Text Books / References

Douglas Hall, Digital Circuits and Systems, MGH

Morris Mano, Digital Logic Design, PHI

Syllabus for Unit Test

Unit Test 1	Unit I & II
Unit Test 2	Unit III & IV
Unit Test 3	Unit V & VI

K30204: DISCRETE MATHEMATICS

TEACHING SCHEME		EXAMINATION SCHEME	
Lectures	: 04 Hrs/week	Theory	: 80 Marks
Practical	: 02 Hrs/week	Duration	: 03 Hours
		Unit Test	: 20 Marks
		T. W. & Pr.	: 50 Marks

Unit -I (08 Hours)

Fundamental Structures And Basic Logic:

Sets, Venn Diagram, Completeness, Cartesian Product, Power Sets, Pigeonhole Principle, Cardinality and Count-ability. Propositional Logic, Logical Connectives, Truth Tables, Normal Forms, Validity, Predicate Logic, Limitations of Predicate Logic, Universal and Existential Quantification, MODUS Ponens and Modus Tollens.

Unit –II (08 Hours)

Functions and Relations:

Subjective, Injective, Bijective and Inverse Functions, Composition of Function. Reflexivity, Symmetry, Transitivity, and Equivalence Relations, Poset & Recurrence Relation.

Unit-III (08 Hours)

Proof Techniques:

Notions of implication, Converse, Inverse, Contra-positive, Negation and Contradiction, Structure of Formal Proofs, Directs Proofs, Proof by Counter Example, Proof By Contradiction, Mathematical Induction, Strong Induction, Recursive Mathematical definitions, Well orderings.

Unit-IV (09 Hours)

Graph Theory:

Basic Terminology, Multi Graphs and Weighted Graphs, Paths and Circuits, Shortest Path Problems, Euler and Hamiltonian Paths, Representation of Graph, Factors of Graph, Isomorphic Graphs, Planar Graphs, Directed graphs.

Unit-V (06 Hours)

Trees :

Trees, Rooted Trees, Path Length in Rooted Tree, Binary Search Trees, Spanning Trees and Cut set, Minimal Spanning Trees, Kruskal's and Prim's Algorithms for Minimal Spanning Tree.

Unit-VI (06 Hours)

Algebraic Systems:

Algebraic Systems, Groups, Semi Group, Monoid, Subgroup , Isomorphism and Homomorphism, Rings and Fields, Lattices, Boolean lattices and Boolean Algebra, Group Codes.

List of Practicals

Concerned staff member is directed to frame 2 To 3 assignments on each Unit

Text Books / References

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

Kenneth H. Rosen, Discrete mathematics, 5th Edition, McGraw Hill Pub

Tremblay Manohar, Discrete Mathematical Structures in Com. Sci Applications

Lipschutz Lipson, Discrete Mathematics, 2nd Edition TMH

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

Syllabus for Unit Test

Unit Test 1	Unit I & II
Unit Test 2	Unit III & IV
Unit Test 3	Unit V & VI

K30205: INTERNET PROGRAMMING

TEACHING SCHEME
Lectures : 04 Hrs/week

EXAMINATION SCHEME
Theory : 80 Marks
Duration : 03 Hours
Unit Test : 20 Marks

Unit -I (09 Hours)

Introduction:

Computer Networks, ARPANET, History of Internet, WWW, Cyberspace, Working of Internet. Internet Technologies: HTML, DHTML, Java Script, PHP, Perl, My SQL, Linux and Internet: Role of Linux on Internet, Role as a server on Internet.

Unit –II (08 Hours)

HTML:

Introduction, Anatomy of HTML document, Web typography, Text basics, Rules, Images and Multimedia: Horizontal rule, Using image in document, Background audio, animAted text, Links, Frames, Tables.

Unit-III (09 Hours)

DHTML:

Dynamic document, Netscape layout extensions. Basic DHTML page building.

Unit-IV (08 Hours)

Java Script:

History, Introduction, role on Internet, String handling, Numbers and dates, Arrays and objects, Variables and functions, Browser feature detection, Dynamic forms.

Unit-V (09 Hours)

Web Databases:

Introduction, Technologies, different databases available and their use. MySQL: Introduction, Installation and configuration, database system concept, SQL overview, Introduction to Apache web server.

Unit-VI (09 Hours)

PHP:

History, Introduction, Role on Internet, basic rules of PHP program, Working with Text and Numbers, Making Decisions, Working with arrays, Functions, Web forms.

NOTE:

Staff member should conduct extra practical sessions on above units.

Text Books / References

Bill Kennedy, Chuck Musciano, HTML & XHTML: The Definitive Guide, 5th Edition, O'Reilly Pub

Danny Goodman, JavaScript & DHTML Cookbook, O'Reilly Pub

David Sklar, Learning PHP5, O'Reilly Pub

Davis, Learning PHP and MySQL, O'Reilly Pub

Syllabus for Unit Test

Unit Test 1	Unit I & II
Unit Test 2	Unit III & IV
Unit Test 3	Unit V & VI

K30206: PROGRAMMING LABORATORY - I

TEACHING SCHEME		EXAMINATION SCHEME	
Lectures	: 02 Hrs/week	Duration	: 03 Hours
Practical	: 02 Hrs/week	T. W. & Or.	: 50 Marks
Tutorials	: 02 Hrs/week	T. W. & Pr.	: 50 Marks

Unit -I (06 Hours)

Functions:

Need Function Definition, Prototype, Function, Parameter, Recursion, Scope of in the Function, Library Functions, Passing Array to Function, Pointer to Function

Pointers - Fundaments, Declaration, Advantage, Pointers to Different Data Types, Array And Pointers, Array to Pointers, Operations on Pointers.

Unit –II (08 Hours)

Structure:

Definition, Declaration, Array to Structures, Structures Within Structures, Structures, and Function, Structures and Pointers, self Referential Structures User Defined data types – typedef Union - Need definition, Operation, Bit Fields, Difference Between Structure and Union. File Handling - Structure of file, File types, File Operations Macros - Substitution, File Inclusion, Complier, Controlled Directives.

Unit-III (10 Hours)

Introduction to Object Oriented Programming :

Need of Object Oriented Programming: A look at Procedure Oriented Programming, Object Oriented Programming Paradigm Basic Concept of OOP - Objects, classes, Data Abstraction, Encapsulation, Inheritance, Polymorphism, Data hiding, and Message Passing. Benefits of OOP, Application of OOP. Beginning with C++: Introduction to C++, Structure of C++ Program, A simple C++ program, comments, output using Cout, input using Cin, declaration of variables, Reference variables, Token, Keywords, Identifier, Constant, Basic data types, Derived data types. Control structures - Control Structures: If statement, switch statement, Do while statement, while statement and for statement.

Unit-IV (10 Hours)

Java Script:

Classes and objects: Specifying a Class, Defining Member function, A C++ program with class, Nesting of member function, Private member function, Array within a class, memory allocation for objects, Static Data member, Static member function, Array of Objects, Objects as function argument, Friend function, Returning objects.

Constructor and destructor : Constructor Parameterized Constructor, Multiple Constructor in a class, and Constructor with default argument, Dynamic Initialization of Objects, Copy Constructor, Destructor

Unit-V (06 Hours)

Functions and Operator overloading :

Function in C++: The main function, Function prototype, Call by value, Call by reference, Return by reference, Inline Function, Default Argument, Function Overloading, Operator - Operator in C++, Scope Resolution Operator, Operator Precedence Operator Overloading - Defining Operator overloading, Overloading Unary and Binary operator, Overloading binary operator using friend, Rules for operator overloading, Type conversion Inheritance - Virtual function and Polymorphism, Inheritance: Introduction, Defining Derived classes, Types of inheritance, Virtual base classes, Abstract classes, Constructor in derived class.

Pointer, Virtual Function and Polymorphism: Introduction, Pointer to Object, this pointer, Pointer to Derived classes, Virtual function.

Unit-VI (10 Hours)

Managing Console I/O operation and File Operation :

Managing Console I/O operation: C++ Stream, C++ Stream Classes, Unformatted I/O Operation, Formatted Console I/O operation, Managing Output with manipulators

Working with files: Classes for File Stream Operations, Opening and Closing a File, Detecting End Of File ,More about Open() : File Modes, File Pointer and their manipulator, Sequential Input and Output Operations, Updating a

File: Random Access. Error handling during file operation,

Template: Function template, Class Template

List of Practicals

PROGRAMMING LAB - I

1. Term work should include minimum 12 experiments from the above Units.
2. The programs can be developed with Integrated Development Environment (IDE) like Borland C++ or any suitable Compiler with emphasis on step by step development and debugging.

Text Books / References

Kanetkar Y P, Let us C, BPB Publications

E. Balaguruswami, Programming in ANSI C, Tata McGraw Hill

H. Schildt, C The complete Reference, Tata McGraw Hill

V. Raja Raman, Computer Oriented Numerical Methods, 3rd Edition Prentice Hall

Oualline, Practical C++ Programming 2ed, Oreilly

E. Balgurusamy, Object Oriented Programming with C++, Tata McGraw Hill

Schildt, C++ the Complete Reference , Tata McGraw Hill Publication

Syllabus for Unit Test

Unit Test 1	Unit I & II
Unit Test 2	Unit III & IV
Unit Test 3	Unit V & VI

SEMESTER - IV

K70207: INDUSTRIAL MANAGEMENT

TEACHING SCHEME
Lectures : 04 Hrs/week

EXAMINATION SCHEME
Theory : 80 Marks
Duration : 03 Hours
Unit Test : 20 Marks

Unit -I (09 Hours)

Management and Organization:

Conceptual difference between terms ; Management, Administration and Organization, Evolution of Management Science up to Modern times, Contributions of Taylor, Fayol, Gilbreth, Management as an Art, Science, Profession. Functions and Principles of Management, Levels of Management. Factors deciding selection of type of business organization, sole proprietorship, partnership, Joint stock company, Cooperative enterprise, Public sector undertakings (PSU's). Organization structures – Line, Functional, Line and staff, Committee, Matrix and Project.

Unit –II (08 Hours)

Plant Location and Economics:

Factors governing plant location, Process of plant locations, Plant layouts – Types, Principals of good plant layout, Cellular. Basic economic concepts- Human wants, economic goods, utility, Value, price, cost, profit revenue. Laws of demand and supply, exceptions to these laws, Concept of elasticity of demand, Scales of production, National and International Trade.

Unit-III (09 Hours)

Materials Management and Quality Concepts:

Inventory, Types of inventory, Inventory Control objectives and function, Selective Inventory Control techniques – Costs related to Inventory, EOQ concept, Purchase Procedure (Cycle), Quality related concepts; Inspection, Quality Control, Quality Assurance (ISO 9000), Total Quality management (TQM), Quality Circles.

Unit-IV (09 Hours)

Financial Management:

Definition, Scope and Objective of financial management. Capital, Types of capital, Sources of industrial finance, Elements of cost, Types of overheads. Financial Accounting – definitions, Scope, Objectives. Breakeven analysis, Capital Budgeting Methods (Pay Back, Accounting rate of return (NPV). Types of budget, Financial statements, purpose, Interpretation. Credit Rating of software projects.

Unit-V (09 Hours)

Marketing Management:

Evolution, Marketing and selling concepts, Definitions, Concept of Marketing Mix, Market Segmentation – Objectives, Bases, Benefits, Distribution channels, Advertising, Sales promotion, Sales forecasting. Marketing research, Service sector – growth, types of services, service tax, Service mix. Recent Trends in Retailing, Emerging changes in global marketing.

Unit-VI (08 Hours)

Management Information System (MIS) and Research Methodology:

Meaning, definition, objectives, benefits, flow of Information in the organization with respect to MIS applications in different functional areas of management (Manufacturing, finance, marketing), Research Methodology – Definitions and types of Research – Research Process (Problem formulation, Literature survey, Research design, Sample design and techniques, Types of scales, Data collection, Data analysis and Interpretation-Findings/Suggestions, Preparation of report), E-Governance, E-Business, Patents, Copyright, Trade Marks. .

Text Books / References

O. P. Khanna, Industrial Engineering and Management

Banga and Sharma, Industrial Origination and Engineering Economics

Philip Kotler, Marketing Management

I. M. Pandey, Financial Management

Jayant Oak, Management Information System

S. M. Jawadekar, Management Information System

C. R. Kothari., Research Methodology

K. K. Dewett, Elementary Economic Theory

Horold and Heinz Weinrich, Essentials of Management

Venu Gopal Rao, Serivces Marketing

P. Narayanan, Intellectual Property Laws

M. C. Shukla, Business Organisation and Management

Dr. P. C. Shejawalkar, Dr. Anjali Ghanekar, Principles and Practice of Management

Syllabus for Unit Test

Unit Test 1	Unit I & II
Unit Test 2	Unit III & IV
Unit Test 3	Unit V & VI

K30208: DATA COMMUNICATION SYSTEMS

TEACHING SCHEME
Lectures : 04 Hrs/week

EXAMINATION SCHEME
Theory : 80 Marks
Duration : 03 Hours
Unit Test : 20 Marks

Unit -I (08 Hours)

Introduction:

Data, Signal, Information, Sampling Theorem, Natural and Flat-top Sampling. Pulse Amplitude Modulation. Time Division Multiplexing, Pulse Transmission Over Band Limited Channel, Cross talk, and Guard Time Inter Symbol Interference. Source Coding Techniques in Digital Communication: Pulse Code Modulation Encoder/Decoder, Multiple Channels frame Alignment for PCM-TDM, Simplex, duplex.

Unit –II (08 Hours)

Amplitude and Angle Modulation:

Amplitude Modulation & Its Variations like DSB-FC, SSB-SC, Frequency Modulation, Phase Modulation, Principle of Super Heterodyne Radio Receiver (Block diagrams only). Application in brief for Above Modulation Techniques e.g. radio, T.V., Mobile Phone. Pulse Modulation: Delta modulation. Slope Overload and Adaptive Delta Modulation, Applications Of Above Source Coding Techniques as Data Compression Tools e.g. Linear Predictive Coders, Voice Coders, DMA.

Unit-III (08 Hours)

Communication:

Measure of Information, Entropy, Information Rate, Shannon's Theorems on Channel Capacity, Codes For Error Detection And Correction such as Parity, Vertical Redundancy Check, Longitudinal Redundancy Check, Checksum, Block Check Character, Block codes - Hamming Code, Cyclic Redundancy Check Codes. Line Codes Such As Bipolar, Uni-polar, RZ, NRZ, Manchester, AMI and Handshaking Techniques like FEC, ARQ, Channel Throughput and Efficiency Calculations.

Unit-IV (10 Hours)

Modems:

Digital Continuous Wave Modulation Techniques For Modem Such As ASK, PSK, FSK, Block Diagram of Modem And Interface Control For Typical Modem, Modem Standards. Network Protocols: International Standards Organization - Open System Interconnection (ISO-OSI) Architecture, Seven layer models, Physical layer protocol, RS232, RS-422, RS-449, 4 to 20 mA Current interfaces. Data link level Protocol HDLC, SDLC, X-25, LAN, WAN, ISDN. Telephone Network: Wire telephony, Subscriber loop, Trunk circuits. Four wire terminating set. Public switch telephone networks, Frame Relay.

Unit-V (06 Hours)

Satellite Communication:

Orbital aspects. Geostationary satellite, Station keeping, Frequency plans and polarization, Transponders, Multiple access methods. 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.

Unit-VI (08 Hours)

Cellular Mobile Communication System:

Cell structure, Frequency reuse, Roaming, transmitter, Receiver, Special services provided by cellular phone, IEEE 802.11,WI-FI, Blutooth, GSM, GPRS.

Text Books / References

George Kennedy, Principles of Communication System, McGraw Hill
William Stalling, Data and Computer Communication, PHI
Roddy Coolen, Electronics Communication, PHI, 4th Edition
William Schweber, Data Communication, McGraw Hill
Biglieri, MIMO, Wireless Communications

Syllabus for Unit Test

Unit Test 1	Unit I & II
Unit Test 2	Unit III & IV
Unit Test 3	Unit V & VI

K30209: ADVANCED DATA STRUCTURES

TEACHING SCHEME		EXAMINATION SCHEME	
Lectures	: 04 Hrs/week	Theory	: 80 Marks
Practical	: 02 Hrs/week	Duration	: 03 Hours
		Unit Test	: 20 Marks
		T. W. & Pr.	: 50 Marks

Unit -I (08 Hours)

Non Linear Data Structures:

Trees and Binary trees – Concept and Terminology. Properties, Height of Binary Trees, Balance, Complete Binary Trees, Data structures for Binary Trees. Binary Tree Traversal - Depth-First Traversals, Preorder Traversal, Inorder Traversal, Postorder Traversal, Breadth First Traversal. Algorithm for Tree Traversals (Recursive and Non Recursive). General Trees- Conversion of General Tree to Binary Tree. Insertion into General Trees FIFO Insertion, LIFO Insertion. General Tree Deletion, Expression Tree.

Unit –II (08 Hours)

Threaded Binary Trees:

Concept and Terminology, Insertion and deletion of nodes in Inorder threaded binary tree. Preorder, Inorder and Post order traversals of Inorder Threaded Binary tree, Optional Binary Search Tree and AVL tree, Red Black Tree.

AVL Trees: AVL Balance Factor, Balancing Trees, AVL Node Structure, AVL Insert Algorithm, AVL Delete Algorithm, Delete Right Balance, Adjusting the Balance Factors.

AVL Abstract Data Types: Create AVL Tree, Insert, Delete, Tree Data Processing, AVL Utility Functions- Empty Tree, Full Tree and Count.

Unit-III (06 Hours)

Graphs:

Concept and Terminology, Operations, Graph Storage structures- adjacency matrix, Adjacency list, Graph Algorithms - Depth First Traversal and Breadth First Traversal algorithms. Minimum Spanning Tree, Dijikstra's Algorithm for Shortest path, Prim's Algorithm, Kruskal's Algorithm.

Unit-IV (06 Hours)

Symbol Tables :

Notion of symbol table, Binary search trees, static and dynamic trees, height balanced weight balanced binary trees, hashing techniques Indexed Structures, M-way search trees, B-Trees searching, Overview of B*- trees and B+ Trees.

Unit-V (08 Hours)

File Structures:

Concept of record, File Operations- Create, Update and delete, File system organization- Sequential, Relative, Indexed and Random access mode, Sequential Organization and Access, Relative File Organization, Addressing Techniques. Direct Mapping Techniques, Concept of Index.

Unit-VI (08 Hours)

Introduction to Dynamic programming:

The General Method, Multistage Graphs, All Pair Shortest Path, Single Source Shortest Path- General Weights, Optimal Binary Search Trees, 0/1- Knapsack, The Traveling Salesperson Problem, Divide & Conquer problem, Backtracking, Graph coloring problem

List of Practicals

ADVANCED DATA STRUCTURES

Concerned staff member is directed to frame 2 To 3 assignments on each Unit

Text Books / References

Ellis Howoritz, Sartaj Sahani, Data Structures; Galgotia Publications

Lischner, C++ in Nutshell, Oreilly

Yedidyah Langsam, Moshe J. Augenstein, Aaron M. Tanenbaum, Data Structures Using C and C++, Prentice- Hall India

Alfred V. Aho, John E. Hopcroft, and Jeffery D. Ullman, Data Structures and Algorithms, Addison-Wesley

Richard F. Gilberg and Behrouz A. Forouzan, Data Structures, Brooks, Cole Pub.

Seymour Libschutz, Data structures, Schaum's outline series, Tata Mc Graw Hill

Ellis Howoritz, Sartaj Sahani, Sanguthevar Rajasekaran, Fundamentals of Computer Algorithms, Galgotia Publications

Syllabus for Unit Test

Unit Test 1	Unit I & II
Unit Test 2	Unit III & IV
Unit Test 3	Unit V & VI

K30210: DIGITAL SIGNAL PROCESSING TECHNOLOGY

TEACHING SCHEME

Lectures : 04 Hrs/week
Practical : 02 Hrs/week

EXAMINATION SCHEME

Theory	: 80 Marks
Duration	: 03 Hours
Unit Test	: 20 Marks
T. W. & Or.	: 50 Marks

Unit -I (12 Hours)

Signals and Systems:

Basic concepts of signals as array of values, standard signals, linearity, shift invariance, stability and causality, Linear Shift Invariant (LSI) systems, I/O mapping and difference equations. Linear convolution, properties of linear convolution, computation of linear convolution, A/D conversion process as sampling, quantization, encoding, sampling theorem and anti-aliasing filter, Circular convolution, Properties of Circular convolution, Computation of Circular convolution

Unit –II (12 Hours)

Analysis of Signals:

Fourier transform, Fourier transform of standard signals, properties of Fourier transform, inverse Fourier transform, computation of Fourier transform. Discrete Fourier Transform (DFT), DFT of standard signals, properties of DFT, computation of DFT, Fast Fourier Transform (FFT) using Goertzel, Decimation In Time (DIT) and Decimation In Frequency (DIF) computation of Goertzel, DIT/DIF FFTs, Inverse DFT and computation of IDFT using the FFT algorithms. Magnitude phase transfer functions using Fourier transform, computation for transfer function.

Unit-III (08 Hours)

Analysis of LSI Systems:

Region Of Convergence (ROC) using pole-zero plot and stability analysis, Z transform, Z transforms of standard signals, properties of Z transform, inverse Z transform, computation of Z transform. System functions from Z transform and pole-zero plots, computation of poles and zeros. Geometric constructs for transfer function.

Unit-IV (08 Hours)

Digital Filters:

Implementation of general difference equation, cascade and parallel forms of computation. Finite Impulse Response (FIR) and Infinite Impulse Response (IIR: filters from difference equations, FIR filter design using inverse Fourier transform and Windowing Gibb's phenomenon, computation of windows, IIR filter design using impulse invariance and bilinear transform computation of system function for given design parameters

Unit-V (08 Hours)

DSP Processors:

DSP processors and their desirable features ADSP-21 XX and ADSP-210XX series of DSI processors and their architectural features implementing filters and FFTs on DSP processors

Unit-VI (04 Hours)

Applications of DSP:

A brief overview of applications of DSP in speech and image processing.

List of Practical

Check the performance of a general difference equation LSI system using suitable software package. Write a C function to implement a general difference equation based array mapping and compare the results.

Write C programs to generate samples of Cosine, Sine, and Square, Saw Tooth, exponential and random noise signals at specified sampling frequencies and compare the results with that of a standard software package

Check the performance of a Linear Convolution operation using suitable software package. Write a C function to implement the linear convolution operation and compare the results

Write a C function to compute the Fourier transform of a sequence at a given frequency and using the function, compute the transfer function of a few LSI systems

Write a C function to compute the Z transform of a sequence at a given value of Z and using the function, compute the system function of a few LSI systems at

points on the unit circle and X- Y axes.

Write a C program to accept the coefficients of a difference equation and plot the corresponding poles and zeros against unit circle and compare the results with that of a standard software package.

Write a C program to accept the coefficients of a difference equation generate the magnitude and the phase transfer function plots for the same and compare the results with that of a standard software package.

Write a C program to accept the pole-zero locations for LSI system and convert the same to the coefficients of a difference equation and compare the results with that of a standard software package.

Write a C program to implement a notch band-pass filter at a given frequency using a zero-pole-zero combination.

Write an assembly language routine on a DSP - Processor simulator and test it on a kit with ADC and DAC to perform AD-DA looping, AD-DA looping with inversion & AD-DA looping with half wave rectification.

Write an assembly language routine on an DSP-Processor simulator and test it on a kit with ADC and DAC to perform difference equation implementation with given coefficients. Compare your results with the standard software with the kit.

Write a C program to design low-pass, high-pass FIR filters with given cut-off frequency, given no. Of coefficients and given smoothing window. After generating the filter coefficients use the earlier difference equation function to check the response of the filter at different frequencies.

Write a C program to design Butterworth filters of given order and cut-off frequency using the bilinear transform method. Compare your results with the standard software package.

Write an assembly language routine to implement Goertzel algorithm for DFT at a given k on a DSP-Processor simulator and test it on a kit with ADC and DAC to perform difference equation implementation with given coefficients. Compare your results with the standard software with the kit.

Write a C function to implement DIT FFT of a given length. Compare test it on a kit with ADC and DAC so that the kit may be used as a spectrum analyser.

To implement a harmonic distortion analyser on the DSP Processor kit and test

the result for sinusoidal, square and saw tooth inputs.

Text Books / References

Prokias, Digital Signal Processing, Tata McGraw Hill

Alan V. Oppenheim, Ronald W. Schafer, Digital Signal Processing, Prentice Hall

Syllabus for Unit Test

Unit Test 1	Unit I & II
Unit Test 2	Unit III & IV
Unit Test 3	Unit V & VI

K30211: TECHNIQUES OF MICROPROCESSOR PROGRAMING

TEACHING SCHEME

Lectures : 04Hrs/week
Practical : 02Hrs/week

EXAMINATION SCHEME

Theory	: 80 Marks
Duration	: 03 Hours
Unit Test	: 20 Marks
T. W. & Pr.	: 50 Marks

Unit -I

Introduction To Microprocessor:

Introduction to 16 bit processor- 8086/8088 architecture, minimum and maximum mode configurations, supporting chips 8284, 8286, 8288, Addressing Modes of 8086, Segmentation in 8086.

Unit –II

Programmers Model:

Instruction encoding format, Instruction set, Addressing modes, Assembler directives, 8086 assembly language programming , String operations, file I/o processing , Far & near procedures, Macros, timing & delay routines.

Unit-III

8086 Interrupt Structure:

Interrupt Service Routine, Interrupt Vector Table (IVT) - location of IVT in the memory, contents of IVT, Hardware interrupts and Software interrupts - INTR, NMI and INT n. Interrupt response, Execution of an ISR, priority of 8086 interrupts. 8259A priority interrupt controller.

Unit-IV

I/O Interface:

Serial communication interface Asynchronous & Synchronous communication, Physical communication standards, RS 232, 8251A PCI, Parallel communication, 8255A PPI, interfacing and programming, 4x4 Key matrix interfacing, Seven Segment display interfacing .8257 /8237 DMA Controller. 8253/8254 Programmable Timer.

Unit-V

Multiprocessor Configurations:

Queue status & LOCK facilities, 8086/8088 based multiprocessing systems, Co-processor configurations, closely & loosely coupled configuration, Microcomputer networks, 8087 NDP coprocessor, Processor Architecture, 8089 I/O processor, IOP architecture, Communication between IOP & CPU.

Unit-VI

DOS:

Internals of DOS, DOS loading ,DOS Memory map , Internal & external commands ,command interpreter POST Sequence ,PSP Structure,.Exe & com file structures and conversion ,use of BIOS and DOS calls. INT 10H calls, DOS Calls, INT 21H calls. Difference between DOS & BIOS, TSRS: Types, structures, Details of TSR Types, Structures, writing TSRS in Assembly language.

List of Practicals

Write 8086 Assembly language program (ALP) to add array of N numbers stored in the memory.

Write 8086 ALP to perform non-overlapped and overlapped block transfer.

Write 8086 ALP to find and count negative numbers from the array of signed numbers stored in memory.

Program to check whether the entered password is correct or not.

Write 8086 ALP for the following operations on the string entered by the user.

Calculate Length of the string
Reverse the string
Check whether the string is palindrome or not.

Write 8086 ALP to perform string manipulation. The strings to be accepted from the user is to be stored in code segment Module_1 and write FAR PROCEDURES in code segment Module_2 for following operations on the string:

Concatenation of two strings
Compare two strings
Number of occurrences of a sub-string in the given string

Find number of words, characters, number of lines and number of capital letters from the given text in the data segment
Note: Use PUBLIC and EXTERN directive. Create .OBJ files of both the modules and link them to create an EXE file.

Program for 32 bit hex multiplication.

Write a program to arrange given set of numbers in Ascending/Descending order.

Write assembly language program for BCD to Hex conversion.

Write assembly language program for computing factorial of a number between 0 to 9.

Text Books / References

Ramesh S. Gaonkar, Microprocessor Architecture, Programming and Applications with 8085 Penram International

Douglas Hall, Microprocessor & interfacing Programming & Hardware

Liu Gibson, Microcomputer Systems 8086/8088 family PHI

Peter Abel, Assembly Language Programming

Ray Denkon, DOS Programers Manual

Syllabus for Unit Test

Unit Test 1	Unit I & II
Unit Test 2	Unit III & IV
Unit Test 3	Unit V & VI

K30212: PROGRAMMING LABORATORY - II

TEACHING SCHEME		EXAMINATION SCHEME	
Lectures	: 02 Hrs/week	Duration	: 03 Hours
Practical	: 02 Hrs/week	T. W. & Or.	: 50 Marks
Tutorial	: 02 Hrs/week	T. W. & Pr.	: 50 Marks

Unit -I

An Introduction to Java:

History, Features of Java language, Object oriented features of Java, Benefits of using OOP, Applications of OOP, Virtual Machine and Java Programming Environment, Fundamental Programming Structures in Java. Java and Internet, Hardware and Software requirement, JDK, JRE, JVM Architecture, Byte Code, Byte Code Execution.

Unit –II

Constant, Variables, Data types: Declaration of variable, Scope of variable, Symbolic constant, Type Casting Operators and Expressions: Arithmetic, Relational, Logical, Assignment, Increment, Decrement, Conditional, Bitwise, Special operator, Dot.
Operator Expressions: Arithmetic, Evaluation of expressions, Type conversion in expressions.

Unit-III

Decision making, branching, looping:

Branching: Introduction, If statement, If…Else statement, Nesting of If…Else statement, The Else If ladder, The Switch statement, The ? : operator. Looping: The while statement, The do statement, The for statement, Jumps in Loop, Labeled Loop.

Unit-IV

Classes, Objects and Methods:

Introduction, Defining a Class, Methods, Objects, Accessing class members, Constructors, Methods overloading, Static members, Nesting of methods, Inheritance: Extending a class, Defining a subclass, Multilevel and hierarchical Inheritance. Overriding methods, Final variables, methods, Final Classes, Abstract methods and classes.

Visibility and control.

Unit-V

Arrays, Strings and Vectors:

One dimensional arrays, Two-dimensional arrays, Strings: Strings arrays, String methods. Vectors, Wrapper classes.

Unit-VI

Interfaces:

Introduction, Defining interfaces, Extending Interfaces, Implementing Interfaces, Accessing interface available.

List of Practicals

PROGRAMMING LABORATORY - II
Concern Staff Should Frame 2-3 Assignments on Each Unit.

Text Books / References

Java in a Nutshell, 5th Ed, Oreilly

E. Balagurusamy, Programming with Java

Head First Java, Oreilly

Chavan, Java for Beginners, Shroff Pub.

Herbert Schildt , Java 2 Complete Reference – 5th Edition, Tata MGra Hill

Java How to Program – Dietel & Dietel

Practical Java Projects, Shroff Pub.

Syllabus for Unit Test

Unit Test 1	Unit I & II
Unit Test 2	Unit III & IV
Unit Test 3	Unit V & VI

RULES REGARDING ATKT, CONTINUOUS ASSESSMENT AND AWARD OF CLASS

A. T. K. T.

A candidate who is granted term for B.Tech. Semester-I will be allowed to keep term for his/her B.Tech. Semester-II examination even if he/she appears and fails or does not appear at B.Tech. Semester-I examination.

A candidate who is granted term for B. Tech. Semester - III will be allowed to keep term for his/her B.Tech. Semester-IV examination even if he/she appears and fails or does not appear at B.Tech. Semester-III examination.

A candidate who is granted term for B.Tech. Semester-V will be allowed to keep term for his/her B.Tech. Semester-VI examination if he/she appear and fails or does not appear at B.Tech. Semester-V examination.

A candidate who is granted term for B.Tech. Semester-VII will be allowed to keep term for his/her B.Tech. Semester-VIII examination if he/she appears and fails or does not appear at B.Tech. Semester-VII examination.

A student shall be allowed to keep term for the B.Tech. Semester-III course if he/she has a backlog of not more than 3 Heads of passing out of total number of Heads of passing in theory examination at B.Tch. Semester-I & II taken together.

A student shall be allowed to keep term for the B.Tech. Semester-V of respective course if he/she has no backlog of B.Tech Semester-I & II and he/she has a backlog of not more than 3 Heads of passing in theory examination and not more than 3 heads of passing in termwork and practical examination or termwork and oral examination.

A student shall be allowed to keep term for the B.Tech. Semester-VII course if he/she has no backlog of B.Tech. Semester-III & IV and he/she has a backlog of not more than 3 Heads of passing in theory examination and not more than 3 Heads of passing in termwork and practical examination or termwork and oral examination.

CONTINUOUS ASSESSMENT

In respect of Term work at B.Tech. Semester-I & II, B.Tech. Semester- III & IV and B.Tech. Semester-V & VI, target date shall be fixed for the completion of each job, project experiment or assignment as prescribed in the syllabus and the same shall be collected on the target date and assessed immediately at an affiliated college by at least one pair of the concerned teachers for the subject and the marks shall be submitted at the end of each term to the Principal of the college.

Termwork and performance of Practical/Oral examination shall be assessed on the basis of the depth of understanding of the principles involved, correctness of results and not on ornamental or colorful presentation.

For B.Tech. Semester-VII & VIII, termwork assessment will be done by external and internal examiners jointly during the examination schedule declared by the university. The record of continuous assessment shall be made available to the examiners during Term work and practical and Term work and oral examinations. Examiner shall use this record for overall assessment of the performance of the student. Every practical/termwork assignment shall be assessed on the scale of 20 marks and weightage of 20 marks shall be distributed as follows:

Sr. No.	Activity	Marks
1	Timely Submission	04
2	Presentation	06
3	Understanding	10

Marks obtained out of 20 for all assignments together will be converted on scale of marks assigned to term work of respective subject in the structure of the course.

CLASS

The class should be awarded to the student on the basis of aggregate marks obtained together in both the semesters of the respective year by him. The award of class shall be as follows.

A	Aggregate 66% or more marks	First Class with Distinction
B	Aggregate 60% or marks but less than 66%	First Class
C	Aggregate 55% or more marks but less than 60%	Higher Second Class
D	Aggregate 50% or more marks but less than 55%	Second Class
E	Aggregate 40% or more marks but less than 50%	Pass Class