VIDYASAGAR UNIVERSITY
B.VOC (Software Development)
COURSE STRUCTURE

NO.	COURSE CODE	COURSE TITLE	CREDIT/HOUR	MARKS
		SEMISTER-1		
1	BSDV 1.00	COMMUNICATION SKILL & PERSONALITY DEVELOPMENT	03	100
2	BSDV 1.01	Fundamentals of Computer	04	100
3	BSDV 1.02	Digital Logic and Architecture	04	100
4	BSDV 1.03	C- Programming	04	100
5	BSDV 1.04P	C- Programming lab	03	100
		SEMISTER-2		
1	BSDV 2.01	Data structures and algorithms	04	100
2	BSDV 2.02	Accounting & Management	04	100
3	BSDV 2.03	Office administration & automation lab.	03	100
4	BSDV 2.04P	Accounting practice lab with Tally	03	100
5	BSDV 2.05P	INDUSTRIAL TRAININGS / INTERNSHIP	04	100
		SEMISTER-3		
1	BSDV 3.01	Database management system	04	100
2	BSDV 3.02	Web design	04	100
3	BSDV 3.03	Numerical Analysis	04	100
4	BSDV 3.04P	DBMS lab	03	100
5	BSDV 3.05P	Web Design lab.	03	100
		SEMISTER -4		
1	BSDV 4.01	Object Oriented Programming	04	100
2	BSDV 4.02	Discrete Mathematics	04	100
3	BSDV 4.03P	Object Oriented Programming lab.	03	100
4	BSDV 4.04P	Numerical Analysis lab	03	100
5	BSDV 4.05P	Industrial Training/Internship	04	100
		SEMISTER-5		
1	BSDV 5.01	Software Engineering & Project Management	04	100
2	BSDV 5.02	Dot.Net	03	100
3	BSDV 5.03	Computer Graphics & Multimedia Technology	05	100
4	BSDV 5.04	Elective Subjects-I (any one)	03	100
5	BSDV 5.05P	Computer Graphics & Multimedia Lab.	03	100
		SEMISTER-6		
1	BSDV 6.01	Computer ethics & Netiquette	04	100
2	BSDV 6.02	Computer Network	04	100
3	BSDV 6.03	Elective Subjects-II(any one)	04	100
4	BSDV 6.04P	SEMINER	06	100
5	BSDV 6.05P	PROJECT	06	100

1st Year

1st Semester

BSDV 1.00 Communication Skill & Personality Development

1. Personality enrichment, etiquettes & manners: Introduction to personality development. Elements of good personality. Importance of soft skills. Introduction to corporate culture. Professionalism in service and industry. Grooming, Personal hygiene. Presentation skills & techniques. Personal grooming. Social, business & dining etiquettes. Corporate etiquettes. Social & travel etiquettes. Role played and body language. Impression management. Art of good conversation. Art of intelligent conversation.

2. Personality development strategies: Communication skills, presentation skills, public speaking, speaking, importance and art of 'small talks' before serious business.

3. Interpersonal skills: Dealing with senior, colleagues, juniors, customers, suppliers, contract workers, owners, etc. at work place.

4. Telephonic conversation: Thumb rules, voice modulation, tones, do's and don'ts , clarity and thoughts and expressions.

5. Communication - Introduction to communication: definition, effective communication-completeness, clarity and correctness. Process of communication. Barriers to communication. Presentation skills, public speaking, extempore speaking.

   Oral communication - Face to face conversation, teleconferences, press conferences, public address. Group discussion, Mock GD using video samples quality. How to effectively conduct yourself during GD, do's & don't clarity of thoughts and its expression. Electronic communication : e. mail, Fax

   Business communication - Process of letter writing, memo & memo reports. Notice, Agenda and minutes of meeting. Brochure.

   Employment communication – Resume styles, resume writing. Elements of effective resume, application and other employment letter writing. Interview – purpose, types, interview skills, dressing. Mock interview, following up an application, an interview accepting employment. Resignation.

6. Representation: Presentation skills, seminars skills role plays.

7. Reports - Report writings, structure of reports, organization of the material writing, abstracts and summaries. Writing users instruction manual. Business reports: types and characteristics, components of formal reports. Business proposals – types, contents and elements.

BSDV 1.01: Fundamentals of Computer

Introduction to digital computers: Generation of computers, Different types of computers, Basic 'functional units of a computer - CPU, memory, input-output (I/O) subsystems. control unit. Semiconductor memory technologies, Types of memories - ROM, RAM.

Concepts of algorithm and software. High level language. Assembly language Machine language.

Number systems - Binary, Octal, Hexadecimal and their conversions. Number representation Sign magnitude, 1's complement, 2's complement, fixed and floating point representations, character representation

Basics of Operating Systems, Structural overview - batch processing, time sharing, scheduling, Concept of process. Examples of OS - DOS, Windows, Unix.

BSDV 1.02: Digital logic and Architecture

(Theory + Tutorial)

Boolean algebra, logic gates - AND, OR, NOT , NAND, NOR; Universal gates. Truth tables and Boolean expressions, minimization of Boolean functions - Karnaugh map and Quine-Mc Cluskey method.
Combinational logic circuit Design: Realization of Boolean functions using basic logic gates (AND/OR and NAND/NOR), decoders, multiplexers. logic design using ROMs,

PLAs. Case studies. Computer arithmetic - integer addition and subtraction, Ripple (carry adder, multiplication - shift-and-add.

Memory hierarchy - Cache and Virtual

Sequential logic circuits: Clocks, flip-flops, latches, counters and shift registers, finite- state machine model, synthesis of synchronous sequential circuits, case studies.

BSDV 1.03: C Programming

(Theory + Tutorial)

C Fundamentals - The C Character Set, Identifiers and Keywords, Data Types, Constants, Variables and Arrays, Declarations, Expressions, Statements, Library Functions

Operators and Expressions - Arithmetic Operators, Unary Operators, Relational and Logical Operators and Assignment Operators

Input/output - getchar, putchar, gets, puts, scanf, printf

conditionals and branching - if .else, while, do .while and for statements. Nested Control Structures. Switch, break, continue and goto statements.

Functions - call by value and call by reference; recursion; arrays - single and two dimensional. introduction to pointers: structures: dynamic allocation;

BSDV 1.04P: C Programming laboratory

Familiarization of a computer and execution of sample programs;

roblem solving using C features - Expression evaluation; Conditionals and ranching; Iteration; Functions; Recursion; Arrays; Structures; Pointers.

2nd Semester

PSDV 2.01: Data Structure and Algorithms

Introduction to data structures - arrays and linked lists; stacks and queues; time and space complexities. Trees and Tree traversal.

Searching - Linear search, binary search, binary search trees, heaps, hashing

Sorting - bubble sort, selection sort, quick sort, bucket sort, counting sort, heap sort, merge sort: worst and average case analysis.

BFS, DFS,-shortest path algorithm.

BSDV 2.02: Accounting and Management

Introduction to Management Principle, Open and closed systems
Management Accounting - Definitions, Nature, Functions, and Scope
Accounting Information - Accounting transaction, Accounting standard,
Fundamentals of Computerized Accounting System - Maintaining ledger account,
Recording Cash, Bank and Journal Transactions using appropriate vouchers. Trial
balance] profit & loss account and balance book.

BSDV 2.03P: Office Administration and Automation laboratory

MS Office - Word, Power point, Excel. PageMaker

BSDV 2.04P: Accounting Practice laboratory with Tally

Problem solving using Tally features.

BSDV 2.05P: Industrial Training/ Internship

2ⁿᵈ Year

3ʳᵈ Semester

BSDV 3.01: Database management system (DBMS)

Database system architecture Data Abstraction, Data Independence, Data Definition and Data Manipulation Languages.

Data models Entity-relationship, network, relational and object oriented data models, integrity constraints and data manipulation operations.

Relational query languages Relational algebra, tuple and domain relational calculus, SQL and QBE.

Relational database design Domain and data dependency, Armstrong's axioms, normal forms, dependency preservation, lossless design.

Query processing and optimization Evaluation of relational algebra expressions, query equivalence, join strategies, query optimization algorithms.

Storage strategies Indices, B-trees, hashing.

Transaction processing Recovery and concurrency control, locking and timestamp based schedulers, multiversion and optimistic Concurrency Control schemes.

BSDV 3.02: Web design

Introduction to Internet and World Wide Web; Evolution and History of World Wide Web; Basic features; Web Browsers; Web Servers; Hypertext Transfer Protocol, Overview of TCP/IP and its services; URLs; Searching and Web-Casting Techniques; Search Engines and Search Tools; Web Publishing: Hosting your Site; Internet Service Provider; Web terminologies, Phases of Planning and designing your Web Site; Steps for developing your Site; Choosing the contents; Home Page; Domain Names, Front page views, Adding pictures, Links, Backgrounds, Relating Front Page to DHTML. Creating a Website and the Markup Languages (HTML, DHTML); Web Development: Introduction to HTML; Hypertext and HTML; HTML Document Features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring; Text colors and Background; Formatting text; Page layouts; Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes; DHTML: Dynamic HTML, Features of DHTML,CSSP(cascading style sheet positioning) and JSSS(JavaScript assisted style sheet), Layers of Netscape, The ID attributes, DHTML events.

BSDV 3.03: Numerical Analysis

Errors: Different types of errors in computation: Sources of Errors, Significant figures-Absolute, Relative and Percentage errors.

Finite differences: Forward and Backward differences.

Interpolation: Newton's Forward interpolation, Newton's Backward interpolation and Lagrange interpolation.

Numerical Integration: Derivation of general formula for numerical integration using Newton's forward difference formula, Trapezoidal rule Simpson's 1/3 rule and Simpson's 3/8 rule.

Solution of Algebraic and Transcendental Equation: Bisection method,

eration method, Newton-Raphson Method, Regula-Falsi Method.
olution of system of linear equation: Gaussion elimination, Gauss seidel meth(
acobi iteration method.
iumerical solution of ordinary differential equations: Euler, Runge-Kutta.

3SDV 3.04P: DBMS laboratory

)atabase schema design, database creation, SQL programming and report generation using a
ommercial RDBMS like ORACLE/SYBASE/DB2/SQL-Server/INFORMIX. Students are to
ie exposed to front end development tools, ODBC and CORBA calls from application
'rograms. internet based access to databases and database administration.

BSDV 305P: Web Design Laboratory

1.Develop static pages (using Only HTML) of an online Book store.

2 Validate the Registration, user login, user profile and payment by credit card pages using
JavaScript.

3. Create and save an XML document at the server, which contains 10 users information.
Write a program, which takes User Id as an input and returns the user details by taking the
user information from the XML document.

4. Install TOMCAT web server. Convert the static web pages of assignments 2 into dynamic
web pages using Servlets and cookies. Hint: Users information (user id, password, credit card
number) would be stored in web.xml. Each user should have a separate Shopping Cart.

5. Redo the previous task using JSP by converting the static web pages of assignments 2 into
dynamic web pages. Create a database with user information and books information. The
books catalogue should be dynamically loaded from the database. Follow the MVC
architecture while doing the website.

6. Implement the "Hello World!" program using JSP Struts Framework.

7. Redo the problem 4 using PHP.

Additional

1. Write an HTML page including any required Javascript that takes a number from one text
field in the range of 0 to 999 and shows it in another text field in words. If the number is out
of range, it should show "out of range" and if it is not a number, it should show "not a
number" message in the result box.

2. Write a java swing application that takes a text file name as input and counts the
characters. words and lines in the file. Words are separated with white space characters and
lines are separated with new line character

3. Write a simple calculator servlet that takes two numbers and an operator (+, -, /, * ; from an HTML page and returns the result page with the operation performed operands. It should check in a database if the same expression is already computed an just return the value from database. Use MySQL or Postgre SQL.(Do the same problem PHP)

4. Write an HTML page that contains a list of 5 countries. When the user selects a country, ... capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).

5. Write a servlet that takes name and age from an HTML page. If the age is less than 18, it should send a page with "Hello <name>, you are not authorized to visit this site" message, where <name> should be replaced with the entered name. Otherwise it should send "Welcome <name> to this site" message. (Do the same problem using PHP)

4th Semester

BSDV 4.01: Object Oriented Programming

key concepts of Object-Oriented Programming --Advantages – Object Oriented Languages. Introduction to C++ . I/O in C++ - C++ Declarations. Control Structures : - Decision Making and Statements : If .. else ,jump, go to, break, continue, Switch case statements - Loops in C++ :For, While, Do - Functions in C++ - Inline functions – Function Overloading.

Classes and Objects : Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – BVSD fields and classes – Constructor and destructor with static members. Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.

Pointers – Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object – Binding , Polymorphism and Virtual Functions. Files – File stream classes – file modes – Sequential Read / Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling - String – Declaring and Initializing string objects – String Attributes – Miscellaneous functions .

BSDV 4.02: Discrete-Mathematics

(Theory + Tutorial)

Relations and functions, binary relations, equivalence relations, partial order, principles of mathematical induction.
Basic counting techniques - inclusion and exclusion, pigeon-hole principle, permutation, combination, summations. Introduction to recurrence relation and generating function.
Algebraic structures - semi groups, monoids and groups, posets and lattices.

BSDV 4.03P: Object Oriented Programming Laboratory

- Design C++ classes with static members, methods with default arguments, friend functions. (For example, design matrix and vector classes with static allocation, and a friend function to do matrix-vector multiplication)
- Implement complex number class with necessary operator overloading and type conversions such as integer to complex, double to complex, complex to double etc.
- Implement Matrix class with dynamic memory allocation and necessary methods. Give proper constructor, destructor, copy constructor, and overloading of assignment operator.
- Overload the new and delete operators to provide custom dynamic allocation of memory.
- Develop a template of linked-list class and its methods
- Develop templates of standard sorting algorithms such as bubble sort, insertion sort; merge sort, and quick sort.
- Design stack and queue classes with necessary exception handling.

BSDV 4.04P : Numerical Analysis laboratory

Problems on Numerical methods:
Solution of equations by Bisection, Iteration, Regular-falsi, Newton Raphson. Solution of system of equations by Gauss's elimination, Gauss-Seidel. Interpolation: Newton forward and Backward and Lagrange interpolations. Integration: Trapezoidal, Simpson's 1/3rd & 3/8thintegration rules. Ordinary Differential Equation: Euler's & Runga Kutta method.

BSDV 4.05P: Industrial Training / Internship

3rd Year

5th Semester

BSDV 5.01: Software Engineering & Project Management

Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models. **Software Requirements Analysis & Specifications:** Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS .

Software Project Management Concepts: The Management spectrum, The People The Problem, The Process, The Project.

Software Project Planning: Size Estimation like lines of Code &Functio Estimation Models, COCOMO, Risk Management.

Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, Software Metrics: Software measurements: What &Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics,

Software Implementation: Relationship between design and implementation, Implementation issues and programming support environment. Coding the procedural design, Good coding style.

Software Testing: Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing, Debugging Activities.

Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

BSDV 5.02: Dot.Net

Basic of the .net framework: .net architecture, managed code, assemblies, CLR, execution of assemblies code, IL, JIT, .NET framework class library, common type system, common language specification, interoperability with unmanaged code.

Introduction to VB.Net and C#: VB.Net: Net features, Data Types C#: Data Types, Operators, Garbage Collection, Jagged Array, Collection (Array list, Hash table), Indexer(One Dimension) and property, Delegates and events (Multicasting, Multicasting Event), Exception Handling.

ADO.Net & Object Oriented Concepts (Using VB.Net or C#): Basic window control, Architecture of ADO.Net, Comparison with ADO, .Net Data provider, Data Adapter, Data Set, Data Row, Data Column, Data Relation, command, Data Reader, Data Grid Constructor, Destructor, Abstraction, interface, polymorphism (Over loading and over ridding)

ASP.Net : Anatomy of ASP.NET Page, Server Controls : label, dropdown list box, validation controls, list box, text box, radio button, check box, State Management: session, caching, Authentication (window,.Net Passport, Forms Based), Authorization, web services, Advance Grid Manipulation

BSDV 5.03: Computer Graphics &Multimedia Technology

1. Development of Computer Graphics: Basic graphics system and standards, Raster scan and random scan, graphics; Continual refresh and storages display, display processors and character generator, Colour display techniques, Frame buffer and bit operations, concepts in raster graphics.

2. Points, Line and Curves; Scan Conversion; Line drawing algorithms; circle and ellipse generation; Polygon filling; Conic-section generation, Ant-aliasing.

3. Two-dimensional viewing: Basic transformations; Co-ordinate systems; Win and Clipping; Segments; Interactive picture-construction techniques; int input-output device.

4. Three-dimensional Concepts: 3-D representation and transformations; 3-D vi algorithm for 3-D volumes, spline curves ad surface; Fractals; Quad tree and oct-tree data structures; Hidden line and surface rendering, and animation.

5. An Introduction – Multimedia applications – Multimedia System Architecture – Evolving technologies for Multimedia -Defining Objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases.

6. Compression & Decompression – Data & File Format standards – Multimedia I/O technologies – Digital voice and audio – Video image and animation – Full motion video – Storage and retrieval Technologies.

BSDV 5.04: Elective I

VSDV 5.05P: Computer Graphics & Multimedia Laboratory

1. Point plotting, line & regular figure algorithms
2. Raster scan line & circle drawing algorithms
3. Clipping & Windowing algorithms for points, lines & polygons
4. 2-D / 3-D transformations
5. Simple fractals representation, Demonstrate the properties of the Bezier curves.
6. Filling algorithms, Clip line segments against windows
7. Web document creation using Dreamweaver.
8. Creating Animation using Flash.

6th Semester

BSDV 6.01: Computer ethics & Netiquette

Computing as a Profession: Professionalism; Strongly differentiated and non-differentiated profession; Characteristics of a profession; the system of professions, professional relationships; codes of professional conduct;

• Philosophical framework and Computer Ethics: Ethical issues in cyberspace; Meta-ethics (Relativism); Normative Ethics (Duty-based Ethics, Result-based Ethics, Golden Rule, Social Contract Theory/Rawls' Theory of Justice, and Virtue Ethics); Applied Ethics; Computer Ethics what and why; Hacker Ethics; Netiquette; Accountability and responsibility of buying and selling software.

• Information security and crimes in cyberspace: Potential risks, vulnerabilities and threats; countermeasures; some common application failures; computer crimes and law.

- Personal data privacy in cyberspace: Personal privacy in the ICT age; protection of data privacy (technical and informal approaches), India privacy laws

- Copyright and intellectual property rights in cyberspace: Intellectual property; legal protection (copyright, patents, trade secrets, trademarks and service marks); ethical and legal issues of software ownership (ethical perspectives of IP rights. the consequentialist argument for software ownership right); morality of copying proprietary software.

- Methods and Tools for Ethical Analysis: Critical thinking; logical fallacies and logical argument analysis; ethical analysis; analysis frameworks

Netiquette basics Core rules of netiquette. Netiquette for electronic miles, Netiquette for Discussion groups, Rules of Flaming, Netiquette for information retrieval, Violations of netiquette. Business Netiquette Electronic mail at work. Netiquette related to Company and cyberspace. Social netiquette. Netiquette at home and school/college.

SDV 6.02: Computer Network

network architecture – layers – Physical links – Channel access on links – Hybrid multiple access techniques - Issues in the data link layer - Framing – Error correction and detection – link-level Flow Control

medium access – CSMA – Ethernet – Token ring -- FDDI - Wireless LAN – Bridges and switches Circuit switching vs packet switching / Packet switched networks – IP – ARP – RP – DHCP – ICMP – Queueing discipline – Routing algorithms – RIP – OSPF – subnetting – CIDR – Interdomain routing – BGP -- Ipv6 – Multicasting – Congestion avoidance in network layer

– TCP – Adaptive Flow Control – Adaptive Retransmission - Congestion control – congestion avoidance – QoS

(SMTP, MIME, IMAP, POP3) – HTTP – DNS- SNMP – Telnet – FTP – Security –

– SSH

V 6.03: Elective II

V 6.04P: Seminar

V 6.05P: Project

[The aim of the Project work is to acquire industrial knowledge on the implementation of the softwar development concepts. Each student should carry out individually one Project Work and it may be a work using the software tools/ languages that they have learned].

Elective Subjects (5.04) (any one)

BSDV 5.04 A   **Entrepreneurship Development**
BSDV 5.04 B   **e-Commerce**
BSDV 5.04 C   **Green computing & e-waste management**

BSDV 5.04A ENTREPRENEURSHIP DEVELOPMENT

Concepts of entrepreneur: Entrepreneur- Definitions-Characteristics of entrepreneur- Classification of entrepreneur-Entrepreneurial traits- Entrepreneurial functions role of entrepreneurs in the economic development- Factor effecting entrepreneurial growth- Entrepreneurship - Meaning- definition- Entrepreneur Vs Intrapreneur- Women Entrepreneurs- Recent development- Problems- Entrepreneurial Development Programmes- Objectives of EDP-Methods of training- Phases of EDP

Institutional support and incentives to entrepreneurs- Functions of Department of Industries and Commerce (DIC) - Activities of Small Industrial Development Corporation (SIDCO)-Functions of National Small Industries Corporation(NSIC)-Functions of Small Industries Development Bank of India (SIDBI)-Khadi Village Industry Commission (KVIC)-
Small Industries Service Institute (SISI)- Functions and services of Kerala Industrial Technical Consultancy Organisation (KITCO)-Activities of Science and Technology Entrepreneurship Development Project (STEDP)-Strategies of National entrepreneurship Development Board(NEDB)-Objectives of National Institute for entrepreneurship and smallbusiness development (NIESBUD)- Techno park-Functions of techno park Incentives-Importance- Classification of incentives- Subsidy- Types of Subsidy

Micro Small and Medium Enterprises- Features- Objectives- Importance- Role of SME in the economic development- MSME Act 2006- Salient features- Credit Guarantee Fund Trust Scheme for MSMEs - Industrial estates-Classification-Benefits-Green channel-Bridge capital- Seed capital assistance-Margin money schemes –Single Window System- Sickness- Causes –Remedies- Registration of SSI

Setting up of Industrial unit-(Only Basic study) Environment for Entrepreneurship –Criteria for selecting particular project- Generating project ideas- Market and demand analysis-Feasibility study- Scope of technical feasibility- Financial feasibility- Social cost benefit analysis-Government regulations for project clearance- - Import of capital goods- approval of foreign collaboration-Pollution control clearances- Setting up of micro small and medium enterprises-Location decision- Significance.

Project Report-Meaning-Definition-Purpose of project reports-Requirements
...d report-Methods of reporting-General principles of a good reporting system--
...forma of a project report-Sample project report.

...DV 5.04B e-Commerce

...tory of e-commerce, definition, classification- B2B, B2C, C2C, G2C, B2G sites,
...mmerce in education, financial, auction, news, entertainment sectors, Doing e-
...mmerce.
...ctronic payment systems – relevance of currencies, credit cards, debit cards, smart
...ds, e-credit accounts, e-money, security concerns in e commerce, authenticity,
...acy, integrity, non-repudiation, encryption, secret key cryptography, public key
...ptography, digital signatures, firewalls
...ss marketing, segmentation, one-to-one marketing, personalization and behavioral
...keting, web advertising, online advertising methods, advertising strategies and
...motions, special advertising and implementation topics.
...ile Commerce: attributes and benefits, Mobile Devices, Computing software,
...less Telecommunication devices, Mobile finance applications, Web 2.0 Revolution,
...al media and industry disruptors, Virtual communities, Online social networking:
...cs and examples, Web 3.0 and Web 4.0, Civil law, intellectual property law,
...mon law and EC legal issues.

...V 5.04C Green computing & e-waste management

...n Computing Fundamentals – Energy efficient , Power efficient and thermal aware
...munication Newton's cooling model and basic thermodynamics and sustainability

...leware support for green computing- Power states, Voltage and Frequency scaling,
...l support for Linux and windows, compiler optimization, virtualization and server
...lidation.

...for monitoring – Sensor networks, cooling equipment and their behavior

...Computing – Hadoop, Resource Management in Virtualized Environment, Dynamic
...al aware scheduling

...Mobile, embedded computing & networking

...nic Waste (E-waste)- Introduction to e-waste: environmental and social issues,
...e and types, Constituents of e-wastes, recycling of ewaste and its
...nmental consequences, Transboundary movement and management of e-
...s, Basel convention, Concept of Extended Producer Responsibility (EPR).

6.03A   Cryptography and Network Security
6.03B   Soft Computing
6.03C   Internet Technology
6.03D   O.R. methods with Problem
6.03E   Graph Theory

6.03A   Cryptography and Network Security

...rity trends – Attacks and services – Classical crypto systems – Different types of

...ers – LFSR sequences – Basic Number theory – Congruences – Chinese

...mainder theorem – Modular exponentiation – Fermat and Euler's theorem – Legendre

...Jacobi symbols – Finite fields – continued fractions

...mple DES – Differential cryptoanalysis – DES – Modes of operation – Triple DES –

...FS – RC4 – RSA – Attacks – Primality test – factoring.

...iscrete Logarithms – Computing discrete logs – Diffie-Hellman key exchange –

...Gamal Public key cryptosystems – Hash functions – Secure Hash – Birthday attacks -

...HDS – Digital signatures – RSA – ElGamal – DSA.

...uthentication applications – Kerberos, X.509, PKI – Electronic Mail security – PGP,

...MIME – IP security – Web Security – SSL, TLS, SET.

System security – Intruders – Malicious software – viruses – Firewalls – Security Standards.

BSDV 6.03B   Soft Computing

FUZZY SET THEORY : Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set-theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If- Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems – Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling.

OPTIMIZATION: Derivative-based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative-free

Genetic Algorithms – Simulated Annealing – Random Search – Downhill
...Search

...CIAL INTELLIGENCE : Introduction, Knowledge Representation – Reasoning, ...Acquisition: Prepositional and Predicate Calculus Rule Based knowledge ...ation Symbolic

...Under Uncertainity Basic knowledge Representation Issues Knowledge ...Heuristic Search: Techniques for Heuristic search Heuristic Classification – ...Search: Strategies Implementation of Graph Search Search based on Recursion ...directed Search Production System and Learning.

...RO FUZZY MODELING : Adaptive Neuro-Fuzzy Inference Systems – Architecture – ...Learning Algorithm – Learning Methods that Cross-fertilize ANFIS and RBFN – ...Neuro Fuzzy Modeling -- Framework Neuron Functions for Adaptive Networks – ...Fuzzy Spectrum.

...6.03C Internet Technology

...Internet & WWW : Evolution of the Internet and the Growth of the World Wide Web, ...Server model, Architecture of the Intranet/ Internet /Extranet, Access methods: ...ISDN, ADSL/2+, cable, LAN, WIFI, Mobile &Satellite, Proxy servers, Application areas: ...merce, Education, Entertainment such as games and gambling, Portals, discussion ...Weblogs, Podcasting, RSS / ATOM, Wiki, VoIP, video on demand, Search Engines, ...bots, integrity of information, databases online, Static and dynamic HTML, Multimedia ...text, graphics, sound, animation and video -performance and quality issues; ...ning, Hosting.

...OCESS, STANDARDS AND PROTOCOLS : URL, TCP/IP fixed and dynamic IP ...ssing, Role of DNS, Email. email clients, server and gateways; SMTP,POP3, ...P & Webmail, File transfer – FTP, Remote login – telnet. WWW – HTTP and ...TPS, Role of W3C, Mobile computing, wireless, 3G, GPS.

...CURITY AND PERFORMANCE : ...policies/Privacy/Identification/Authentication/Access control, Hardware and ...ware, Risk assessment, Vulnerabilities, Threats and attack methods such as ...ses, Spam, Root kits, "phishing", Firewalls – spyware plug-ins, Performance : ...ed, reliability, downtime, bandwidth.

...V 6.03D : O.R. methods with Problem

...mulations and graphical solution of two variables. Canonical and standard terms of linear ...gramming problem, simplex method, Big-M method, transportation and assignment

sequencing problem. Game theory (deterministic case only). Network analysis. Inventory control.

Problems on OR

Solution of LPP by Simplex method. Transportation and assignment problems. PERT and CPM. Simple inventory problems

BSDV 6.03E: Graph Theory

INTRODUCTION

Graphs – Introduction – Isomorphism – Sub graphs – Walks, Paths, Circuits – Connectedness – Components – Euler Graphs – Hamiltonian Paths and Circuits – Trees – Properties of trees – Distance and Centers in Tree – Rooted and Binary Trees.

TREES, CONNECTIVITY, PLANARITY

Spanning trees – Fundamental Circuits – Spanning Trees in a Weighted Graph – Cut Sets – Properties of Cut Set – All Cut Sets – Fundamental Circuits and Cut Sets – Connectivity and Separability – Network flows – 1-Isomorphism – 2-Isomorphism – Combinational and Geometric Graphs – Planer Graphs – Different Representation of a Planer Graph.

MATRICES, COLOURING AND DIRECTED GRAPH

Incidence matrix – Sub matrices – Circuit Matrix – Path Matrix – Adjacency Matrix – Chromatic Number – Chromatic partitioning – Chromatic polynomial – Matching – Covering – Four Color Problem – Directed Graphs – Types of Directed Graphs – Digraphs and Binary Relations – Directed Paths and Connectedness – Euler Graphs – Adjacency Matrix of a Digraph.

ALGORITHMS I

Algorithms: Connectedness and Components – Spanning tree – Finding all Spanning Trees of a Graph – Set of Fundamental Circuits – Cut Vertices and Separability – Directed Circuits.

ALGORITHMS II

Algorithms: Shortest Path Algorithm – DFS – Planarity Testing – Isomorphism.

Suggested Readings

1. Learn Microsoft Office, Russell A. Stultz. BPB Publication
2. Microsoft Office XP Fast and Easy. Koers, D , PHI.
3. Office XP: The Complete Reference. Nelson, S L and Kelly, J , Tata McGraw-Hill
4. Gottfried, Byron S., Programming with C, Tata McGraw Hill
5. Computing Fundamentals and Programming in C, Gill Nasib Singh: Khanna Books Publishing Co., New Delhi.
6. Programming in ANSI C, 4E, Balagurusamy, E., Tata McGraw-Hill
7. Problem Solving and Program Design in C, Jeri R. Hanly & Elliot P. Koffman, Addison Wesley.
8. Let us C, Yashwant Kanetker, BPB.
9. Computer Programming in C, Rajaraman, V PHI.
10. Working with C, Yashwant Kanetker, BPB.
11. Data Structure, Seymour Lipschutz, Tata-McGraw-Hill
12. Fundamentals of Data Structures in C, Horowitz, Sahni & Anderson-Freed, Orient longman.
13. An Introduction to Data Structures With Application, Trembley, J.P. And Sorenson P.G, Mcgrraw- Hill International Student Edition, New York.
14. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, Addison- Wesley,(An Imprint Of Pearson Education), Mexico City.
15. Business Communication, K K Sinha, Himalaya Publishing House Publication
16. Business Communication, Mohan, Banerjee, Mac million
17. Object-Oriented Programming with ANSI and TURBO C++, Ashok N Kamthane Pearson Education publication.
18. Database Management System, Gerald V. Post, 3rd edition, TMH
19. Object Oriennted Programmingg with C++, E. Balagurusamy, Tata Mc- Grawhill Pupblication, .
20. C++ for you, Maria Litvin & Gray Litvin Vikas publication..
21. Internet and Web Technologies, Raj Kamal, Tata McGraw-Hill.
22. Multimedia and Web Technology, Ramesh Bangia Firewall Media
23. Web Design: The Complete Reference , Thomas A. Powell, 4/e, Tata McGraw- Hill
24. HTML Beginners Guide, Wendy Willard, Tata McGraw-Hill.
25. Internet and World Wide Web, How to Program, Deitel and Goldberg, PHI.
26. Discrete Mathematics, J.K. Sharma Second Edition, Macmillan India Ltd.
27. Business Communication, Bovee, PHI
28. Programming with C, John R Hubbard, 2nd Edition, TMH publication
29. Discrete Mathematics Structures with Applications to computer science ,J. P Tremblay R Manohar ,Mc Graw Hill International Edition
30. Business communication, Raman, Singh Oxford Press
31. Computer Networks, Andrew S. Tanenbaum, 4th edition, PHI.
32. Data Communication and Networks, Achyut Godbole, TMH.COMPUTER
33. Networks Protocols, Standards, and Interfaces ,Uyless Black, 2nd ed, PHI.
34. Database System Using ORACLE,Nilesh Shah, 2nd edition, PHI.
35. Database Management System, Arun Majumdar & Pritimoy Bhattacharya, TMH.

36. Software Engineering Concepts ,Richard Fairley, TMH.
37. Software Engineering for internet applications ,Eve Anderson, Philip Greensp Andrew Grumet, , PHI
38. Software Quality Engineering ,Jeff Tian, Student Edition, Wiley India
39. Computer Graphics ,Donald Hearn, M.Pauline Baker, 2nd edition, PHI.
40. Principles of Multimedia, Ranjan Parekh, TMH.
41. Computer graphics, Amarendra N Sinha, Arun D Udai, TMH.
42. Multimedia : Making it Work ,Tay Vaughan, 7th edition, TMH
43. Applied .Net Frmework Prog. In MS VB.Net, Jeffrey Richter, Francesco Balena: TMH Publication.
44. Complete Reference C#, Herbert Schildt: TMH Publication.
45. Microsoft Visual Basic.NET step by step, Michael Halvorsan: PHI Publication.
46. Microsoft ASP.Net With C#.Net step by step, G.Andew Duthie: PHI Publication.