SHRI JAGDISHPRASAD JHABARMAL TIBREWALA UNIVERSITY
CHUDELA (JHUNJHUNU), RAJASTHAN

INSTITUTE OF SCIENCE
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
TEACHING AND EXAMINATION SCHEME AND DETAILED SYLLABUS FOR

BACHELOR OF COMPUTER APPLICATIONS

EFFECTIVE FROM ACADEMIC SESSION 2012 – 2013

YEAR: I **SEMESTER: I**

BCA101: FUNDAMENTALS OF COMPUTER **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitation, Types of computer, Generation of Computers, Personal Computer (PCs)- evolution of PCs, configurations of PCs-Pentium and Newer, PCs specification and main characteristics. Basic components of a computer system – Control unit, ALU, Input/output functions and characteristics, memory –RAM, ROM, EPROM, PROM and other types of memory.	7
II	Input/output & Storage Units:- Keyboard, Mouse, Trackball, Joystick, Digitizing, tablet, Scanners, Digital Camera, MICR, OCR,OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors – characteristics and types of monitor –Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard – VGA, SVGA, XGA etc, Printers & Types – Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card, and Speakers.	8
III	Number System: Binary, octal, decimal and hexadecimal representation of numbers. Integers and floating numbers. Representation of character, ASCII and EBCDIC codes. Binary arithmetic: addition, subtraction, complements.	7
IV	Storage fundamentals – Primary Vs Secondary Data Storage and Retrieval methods – Sequential, Direct and Index Sequential, SIMM, Various Storage Devices- Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drivers, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD- R, CD-RW, Zip Drives, Flash drives Video Disk, Blue Ray Disc, SD/MMcMemory cards, Physical structure of floppy & hard disk, drive naming conventions in PC. DVD, DVD-RW.	8
V	Software and its Needs, Types of Software- System software, Application software, System Software- Operating system, Utility Program, Programming language, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs- DOS Window, Linux, File Allocation Table(FAT & FAT32), files & directory structure and its naming rules, booting process details of DOS and Windows, DOS system files Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software and its types- Word-processing, Spreadsheets, Presentation Graphics, Data Base Management Software, characteristics, Uses and example and area of applications of each of them, Virus working principles, Virus working principles, Types of viruses, Virus detection and prevention viruses on network.	7
	Total	37

Reference Books:

1. Computer Fundamentals by P.K.Sinha, BPB Publications
2. Fundamentals of information Technology and Computer Programming by V.K.Jain
3. Introduction to Computers and Information Systems by Dr. Sushila Madan, Taxmann Publications

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BCA102: PC Package **(L, T, P) = 3(3+0+0)**

Unit	Contents of Course	Hrs.
I	**Ms Window**: Introduction to M.S Window; Features of Window; Various version of Window & it use; Working with Window ;My computer & recycle bin; Desktop, Icon And Window Explorer; Screen description & working style of window ;Dialog Boxes & Toolbars; Working with Windows; My Computer & Recycle bin; Desktop, Icons and Windows; Dialog Boxes & Toolbars; Windows Explorer; Screen description & working Styles of Windows; Dialog Boxes & Toolbars; Working with files & Folder; Simple operations like copy, delete, moving of files and folders from one drive to another, Shortcuts & Auto starts; Accessories and Windows Settings using Control Panel, modem, printers, audio, networks, fonts, creating users, internet settings, Starts button & Program lists; Installation and Uninstalling new Hardware & Software program on your computer;	7
II	**Office Package-** Office activates and their software requirements, Word-processing, Spreadsheets, Presentation graphics, Database, introduction to MS Office; Introduction to MS-Word; Features & areas of use. Working with MS Word.; Menus & Commands; Toolbars & Buttons; Shortcuts Menus, Wizards & Templates; Creating a New Document; Different Page Views and layouts; Applying various Text Enhancements; Working with - Styles, Text Attributes; Paragraph and Page Formatting; Text Editing using various features; Bullets, Numbering, Auto Formatting, Printing & various print options.	8
III	**Advanced Features of MS-Word:** Spell Check, Thesaurus, Find & Replace; Headers & Footers; Inserting - Page Numbers, Pictures, Files, Auto texts, Symbols etc.; Working with Columns, Tabs & Indents; Creations & Working with Tables including conversion to and from text; Margins & Space management in Documents; Adding Reference and Graphics; Mail Merge, Envelopes and mailing labels, Importing and Exporting to and from various formats .	6
IV	**MS Excel:** Introduction and area of use; Working with MS- Excel.; concepts of Workbook & Worksheets; Using Wizard; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different views of Worksheets; Column Freezing, Labels, Headings, Splitting etc; Using different Features with Data and Text; Use of Formulas, calculation and function; Cell formatting including Models Shading; Working with different Chart Types ; Printing of Workbook and Worksheet with various option .	7
V	**MS-PowerPoint**: Introduction and area of Use; Working with MS-PowerPoint; Creating A New Presentation; Working with Presentation; Using Wizard; Slides and its different views; Inserting, Deleting and Copying of Slides; Working with notes, Handouts, Columns and lists; Adding Graphics, Sound and movies to a slide; Working with PowerPoint objects; Designing and presentation of a Slide show; Printing Presentation, nodes, Handouts with print option, Outlook Express and its features	7
	Total	35

Reference Books:

1. Windows XP Complete Reference, BPB Publication
2. MS-Office XP Complete Reference, BPB Publication
3. MS-Windows XP Home Edition Complete Reference

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BCA103: Programming in C **(L, T, P) = 4(3+1+0)**

Unit	Contents of Course	Hrs.
I	C program structures, Variables, Data Types, Declarations, Operators (Arithmetic, Relational, Logical), increment and decrement operators, Assignment operators and expressions, Arithmetic expressions, statements, symbolic constants, conditional expressions, Bitwise operators, precedence and order of evaluations, input-output functions.	7
II	Statements and Blocks, branching statements (if, switch), Loops (while, for, do-while, repeat-until), Break and continue, go to and labels.	7
III	Array, Type of Array, Strings, Functions, external variables, scope rules, header files, static variables, initialization, parameter passing (call-by-value, call-by-reference), recursion	7
IV	Pointers and addresses, pointers and function arguments, pointer and arrays, Pointer as Function Arguments. Memory allocation in C, storage Classes C preprocessor.	8
V	Structures: Defining and processing, passing to a function, Unions. Files: Standard input and output, formatted output, formatted input, file access.	8
	Total	37

Reference Books:

1. Programming in C by E. Balaguruswamy, TMH Publications
2. Programming with C by Gottfried, Schaums, TMH Publications
3. Thinking in C by Mahapatra, PHI Publications

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BCA104: Elementary Mathematics **(L, T, P) = 4(3+1+0)**

Unit	Contents of Course	Hrs.
I	SETS: Sets, subsets, equal sets, null set, universal set, Venn diagrams, Finite & infinite sets, open & closed sets etc., Union, Intersection, Difference and Compliment of sets, Partition of sets, Cartesian product, Inclusion & Exclusion Principle, Induction method.	7
II	LIMITS & CONTINUITY: Limit at a point, properties of limit, computation of limits of various types of functions. Continuity at a point, continuity over an interval, intermediate value theorem. Type of discontinuities.	6
III	DIFFERENTIATION: Derivative, derivatives of sum, differences, product & quotients, chain rule, logarithmic differentiation, Rolle's theorem, mean value theorem, expansion of functions (Taylor's & Maclaurin's theorem.), Indeterminate forms, L'Hospital rule, maxima & minima, successive differentiation & Liebnitz theorem.	8
IV	INTEGRATION: Integral as limit of a sum, fundamental theorem of calculus, indefinite & definite integrals, methods of integration: substitution, by parts, partial fractions, integration of algebraic and transcendental functions,, reduction formulae for trigonometric functions.	8
V	MATRIX & DETERMINANTS: Introduction, definition of matrix, types of matrices, algebra of matrices, determinants, minors & cofactors, properties of determinants, inverse of a matrix, adjoint of a matrix, rank of a matrix, solution of linear system of equations.	7
	Total	36

Reference Books:

1. Shanti Narayan: Integral Calculus, S.Chand & Co.
2. Sharma, Gokhroo, Saini: Elements of matrices and Determinants, Jaipur Publishing House
3. Schum Series: Discrete mathematics, Tata Mac-Graw Hill

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BCA105: Electrical & Electronics Engineering **(L, T, P) = 3(3+0+0)**

Unit	Contents of Course	Hrs.
I	**DC NETWORKS:** Kirchhoff's Laws, Node Voltage and Mesh Current Analysis, Delta-Star and Star-Delta Transformation, Source Conversion, Classification of Networks Elements, Super position theorem, Theremin's Theorem.	7
II	**SINGLE PHASE AC CIRCUITS:** Generation of Single Phase AC Voltage, EMI Equation, Average, RMS and Effective Values, RLC Series, Parallel and Series- Parallel Circuits, Complex, Representation of Impedance, Phasor Diagram, Power & Power Factor.	7
III	**TRASFORMER:** Transformer: EMF equation, Faradays Laws of Electromagnetic Induction, Construction and Operation of Single Phase Voltage and Current Relationship and Pharos Diagram of Ideal Transformer.	8
IV	**TRANSISTORS:** Bipolar Junction Transistor, Transistor Current Components, Characteristics of CE, CB and CC Transistors Amplifiers.	8
V	**COMMUNICATION SYSTEM:** Introduction to modulation (AM, FM and PM), Demodulation, Demultiplexing, Super heterodyne Radio Receiver, Television, Elementary Concept of Optical, Satellite and Mobile Communication.	7
	Total	37

Reference Books:

1. Electric Circuit Analysis by B.Subramanyam
2. Basic Electrical Engineering by K.N.Srinivas
3. Semiconductor Devices by Yaduvir Singh & Swarajya Agnihotri

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BCA106: Communication English **(L, T, P) = 3(3+0+0)**

Unit	Contents of Course	Hrs.
I	Sentence Elements, Part of Speech(Brief introduction), Sentence and its Type: Simple, Compound, Complex, Assertive, Interrogative, Imperative, and Exclamatory	7
II	Noun and its different types, Pronoun and its different types, Adjective and its different types, Adverbs and its different types	7
III	Tenses: Simple Present, Progressive Perfect, Present Perfect, progressive along-with Past Tense and indications of futurity Reported Speech Voice: Active and Passive	8
IV	Modals, Preposition, Determiners and Articles, The Infinitive & the ING form	8
V	Sub-verb agreement, Relative clauses, Common Errors	7
	Total	37

Reference Books:

1. Business communication and organization and management, C.B.Gupta (Suttan Chand & Sons Educational Publisher).
2. Essential English grammer & composition, James Thoms Pec Chaatt (Holly Faith International)
3. Business Comunication, John M. Penrose (Cengaqe Learning)
4. Write Better; Speak Better, Reader's Digest
5. Bussines Communication, R.C.Bhatia (Ane books Pvt. Ltd., New Delhi)

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BCA107: PC Package Lab **(L, T, P) = 3(+0+3)**

S.No.	List of Experiment	Hrs.
I	Installation of Operating Systems.	3 hrs Weekly
II	Introduction to control panel, Add remove hardware and software, Installation of Hard disk, RAM,CD, ROM,CPU, Mother Board, Keyboard, Mouse,	
III	Ms-Word Basics: Working with MS Word; Menus Commands; Toolbars & Buttons; Shortcut Menus, Wizards & Templates; Creating a New Document	
IV	Ms-Word Lab 2:Spell Check, Thesaurus, Find & Replace; Headers & Footers; inserting-Page Number, Pictures, File, Auto texts, Symbols etc.	
V	Ms-Word lab 3 Working with Columns, Tabs & Indent; Creation & Working with Tables including conversion to and from text; Margins & Space management in Document; adding References and Graphics.	
VI	Ms-Word lab 4: Mail Merge, Envelops& Mailing Labels. Importing and exporting to and from various formats.	
VII	MS Excel Lab 1: Working with Ms Excel; concepts of Workbook & Worksheets; using Wizards; Various Data Types; Using Different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; different Views of Worksheets; Column Freezing,Labels, Hiding, Splitting etc.	
VIII	Ms Power Point: Working with MS Power Point; Creating a New Presentation; Working with Presentation & Presentation of Slide Show; Printing Presentation.	

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BCA108: Computer Programming Lab **(L, T, P) = 3(+0+3)**

S.No.	List of Experiment	Hrs.
I	Simple input output program integer, real character and string. (Formatted & Unformatted)	3 hrs Weekly
II	Conditional statement programs (if, if-else-if, switch-case).	
III	Looping Program. (For, while, do-while).	
IV	Program based on array (one, two, and three dimensions).	
V	Program using structure and unions.	
VI	Program using Function (With and without recursion).	
VII	Simple programs using pointers.	
VIII	File handling.	

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BCA109: Electrical & Electronics Engineering Lab **(L, T, P) = 3(+0+3)**

S.No.	List of Experiment	Hrs.
I	Single line diagram of a power system and a distribution sub-station and basic functional study of main components used in power systems.	**3 hrs Weekly**
II	Make house wiring including earthing for 1-phase energy meter, MCB, ceiling fan, tube light, three pin socket and a lamp operated from two different positions. Basic functional study of components used in house wiring.	
III	Study the construction and basic working of ceiling fan, single phase induction motor and three phase squirrel cage induction motor. Connect ceiling fan along with regulator and single phase induction motor through auto-transformer to run and vary speed.	
IV	(a) Basic functional study and connection of moving coil & moving iron ammeters and voltmeters, dynamometer, wattmeter and energy meter. (b) Run a 3-phase squirrel cage induction motor at no load and measure its voltage, current, power and power factor. Reverse the direction of rotation.	
V	Study the construction, circuit, working and application of the following lamps: (i) Fluorescent lamp, (ii) Sodium vapour lamp, (iii) Mercury vapour lamp, (iv) Halogen lamp and (v) Neon lamp	
VI	(a) Study the construction and connection of single phase transformer and auto-transformer. Measure input and output voltage and fin turn ratio. (b) Study the construction of a core type three phase transformer. Perform star and delta connection on a 3-phase transformer and find relation between line and phase voltage.	
VII	Identification, testing and applications of resistors, inductors, capacitors, PN-diode, Zener diode, LED, LCD, BJT, FET, UJT, SCR, Photo diode and Photo transistor.	
VIII	(a) Functional study of CRO, analog & digital multi-meters and function / signal generator. (b) Study the single phase half wave and bridge rectifier and effects of filters on waveform.	
IX	Study the BJT amplifier in common emitter configuration. Measure voltage gain, plot gain frequency response and calculate its bandwidth.	
X	(a) Study the construction and basic working of SCR. (b) Study the single phase half wave and bridge controlled rectifier and observe the effect of firing angle on waveform.	

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BCA110: Communication & Soft Skill Lab – I **(L, T, P) = 3(+0+3)**

S.No.	List of Experiment	Hrs.
I	Personality and its types	3 hrs Weekly
II	Personality development	
III	Body Language	
IV	Emotion	
V	Leadership and team building	
VI	Goal setting	
VII	Time management	
VIII	Stress management	
IX	Group discussion	
X	Interview techniques	

Reference Books:

1. Business communication and organization and management, C.B.Gupta (Suttan Chand & Sons Educational Publisher).
2. Essential English grammer & composition, James Thoms Pec Chaatt (Holly Faith International)
3. Business Comunication, John M. Penrose (Cengaqe Learning)
4. Write Better; Speak Better, Reader's Digest
5. Bussines Communication, R.C.Bhatia (Ane books Pvt. Ltd., New Delhi)

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YEAR: I **SEMESTER: II**

BCA201: Business Organization & System **(L, T, P) = 3(3+0+0)**

Unit	Contents of Course	Hrs.
I	Business –Meaning and Contents, Business as a system, Business and Legal and Economic Environment, Forms of Business Organization (meaning, merits & demerits).	7
II	Management- Management Principles, Henry fayol's principles of management, Taylor's Scientific Management, Management Process, Basic Functions (in short),Meaning, Nature and Process, Role of Manager.	7
III	Organizational Behavior- Need of Understanding human behavior in organizations, Challenges and opportunities for OB, Contributing disciplines to the field of OB Conceptual Models of OB.	8
IV	Managing Personnel- HRM- Meaning and Functions, Man Power Planning, Job Analysis and Design, Training, Career Planning & Development, Motivation, Compensation Management Managing Finance-Concept of fixed and Working Capital, Main Sources of Finance, Accounting, Meaning, Users, Budgeting- Meaning,Type of Budgets.	7
V	Managing Production- Basic Concepts,Objectives, Elements of Productions, Planning, and Control. Managing Sales and Marketing- Basic Concepts of marketing, Sales Promotions (including Salesmanship).	7
	Total	36

Reference Books:

1. B.P. Singh & T.N. Chabbra, Business Organisation and Management Functions, Dhanpat Rai & Co. 2000.
2. Philip Kotler, Marketing Management –(9th Ed.) Prentice Hall of India.
3. Dr. S.N. Maheshwari, Financial Management – Principles and Practice (6th revised Ed.) S. Chand & Sons.
4. Stephen P. Robbins, Organisational Behaviour (8th Ed.) Prentice Hall of India.

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BCA202: Desktop Publishing & Multimedia **(L, T, P) = 4(3+1+0)**

Unit	Contents of Course	Hrs.
I	Introduction to Multimedia: definition, classification (discrete, continuous, passive, interactive), properties. Medium perception, representation, presentation, storage, and transmission, MM hardware, application areas, stages of MM project, design issues (speed, simplicity, clarity, consistency, ease of use, and navigation) Media and data stream, transmission modes, authoring tools (types, features, card/page-based, time-based, and icon-based)	7
II	Text: text importance, encoding, fonts (type, size, style, leading, and kerning), text in MM (font design, menus, buttons, fields, portrait, landscape), editing design tools, hypertext vs. hypermedia, Sound terminology (acoustic, electromagnetic wave, cycle, frequency, amplitude, decibel), Digital audio (sampling, quantization, file size, size vs. quality, formats).	8
III	MIDI files (creation, size, advantages, and disadvantages). MIDI vs. digital audio, Speech: generation (TTS), recognition (STT), applications, difficulties, program learning), Sound summary, Digital image (bitmap, vector graphic), Bitmap (pixels, color encoding, palette, and models, resolution), Image scanning, capturing, editing, morphing, dithering, file size, format (BMP, GIF, PNG, JPEG, etc), Vector graphics (types, properties, drawing, advantages, disadvantages, file size) Bitmap image vs. vector graphic, Image processing and programming skills.	6
IV	Animation: transition, cell animation (key frames, tweening, layers, morphing, formats), Video: concepts, standards, capturing, analog vs. digital, TV vs, computer video, compression and streaming. Encoding requirements (entropy, source, and adaptive), fixed length vs. variable length encoding, compression (HW vs. SW, lossy vs. lossless	7
V	Compression (symmetric vs. asymmetric, dialogue mode vs. retrieval mode, RLE, Huffman), Compression techniques (JPEG and MPEG).	7
	Total	35

Reference Books:

1. Vaughan Tay, Multimedia: Making it work, Berkeley Osborne McGraw-Hill, 6th Edition 2004.
2. Ralf Steinmetz & Klara Nahrstedt, Multimedia fundamentals Volume 1: Media coding and content processing, Prentice-Hall, 2002.
3. Stephen McLoughlin, Multimedia: Concepts and Practice, Prentice hall, 2001.
4. Ze-Nian Li & Mark S Drew, Fundamentals of Multimedia, Prentice hall, 2004.
5. Jen Dehaan, Macromedia FLASH MX 2004, training from the source, Macromedia press

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BCA203: Internet Technology & Programming **(L, T, P) = 3(3+0+0)**

Unit	Contents of Course	Hrs.
I	**Internet Connection Concepts** – Server, Client and Parts, DNS, Telephone, Cable and Satellite connections- Dialup, ISDN, ADSL and Leased live based connection, Cable and DSS a/c, Web TV and Internet, ISP features. TCP and UDP protocols, URL's, CGI, MIME and introduction to SGML.	7
II	**HTML:** Introduction to HTML, Elements of HTML syntax, Head and Body sections, Building HTML documents, Inserting text, images, hyperlinks, Backgrounds and Color Control, ordered and unordered lists, content layout & presentation. Tables: use of table tags,DIV and SPAN and various other HTML tags .. forms – frames – table	6
III	**Introduction of intranet** - Intranet v/s LAN, Components of Internet-Workstations and Client software, Server and Network operating system. Network cards, cabling and hubs, steps for creating an intranet. Maintenance and connecting to internet.	8
IV	**Web technology** - Elements of web – clients and servers languages and protocols, web page and web sites, special kinds of web sites, web resources – search engines, massage boards, clubs, news groups and chat, web page creation concepts – planning, navigation, themes and publishing. Analyzing web traffic – log file data, analyzing log file and product for analyzing web traffic.	7
V	**E-mail technology** - features and concepts – massage headers, address book, attachment, filtering and forwarding mails. Scripting languages HTML –webpage design – java script introduction – control structures – functions – arrays – objects – simple web applications.	7
	Total	35

Reference Books:

1. Wessly- Firewalls and Internet Security: Repelling the Wily Hacker , Second Edition
2. William Stalling- Cryptography and Network Security, Pearson Education
3. Kahate- Cryptography and Network Security, McGraw-Hill Companies, Second Edition
4. Tanenbaum - Computer Networks, Pearson Education of Asia
5. George Coulouris, Jean Dollimore- Distributed Systems, Pearson Education
6. http://www.ietf.org, Various RFC's and articles (RFC 1010-ARP; RFC 1058-RIP; RFC 1131-OSPF; RFC 1105- BGP)
7. http://java.sun.com, for RMI and CORBA tutorials
8. http://keskus.hut.fi/opetus/s38118/s00/tyot/25/ for wireless LAN

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BCA204: Fundamentals of Accounting and Financial Management **(L, T, P) = 4(3+1+0)**

Unit	Contents of Course	Hrs.
I	Definition of Accounting and its advantages & limitations, Scope of accounting, Branches of Accounting – Financial Accounting – Cost Accounting – Management Accounting, users of Accounting information, Methods of Accounting, Double Entry Accounting System, Types of Accounts and Rules for Debit and Credit. Cash and Credit Transaction, Cash discount and Trade discount. Preparation of Journal, Ledger and Trial Balance. Final Accounts and Accounting Ratios, Preparation of Final Accounts (Sole Proprietorship only), Preparation of Trading A/c, Profit & Loss A/c and Balance Sheet covering simple adjustments	8
II	Accounting Ratios: Meaning, Advantages and Limitations of Accounting ratios Computation of following ratios only.	7
III	Gross Profit Ratio, Net Profit Ratio, Stock Turnover Ratio, Operating Ratio, Current Ratio, Liquid Ratio, Debtors Ratio, Creditors Ratio, Return on Capital Employed, Earning Per Share, Return on shareholders fund.	7
IV	Cost Accounting: Meaning and definition of Cost Accounting – its Advantages & Limitations Budgetary Control, Definitions – Advantages – Limitations, Procedure for setting up Budgetary Control, Different types of budgets, Advantages and limitations of Cash Budget and preparation of Cash Budget.	8
V	Marginal Costing: Meaning-Advantages- Limitations, Break Even Point, Margin of Safety, Profit Volume Ratio, Application of Marginal Costing including simple problems on make or buy and product mix..	7
	Total	37

Reference Books:

1. Accounting by Steven M. Bragg

2. Accounting and financial management

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BCA205: Technical English **(L, T, P) = 3(3+0+0)**

Unit	Contents of Course	Hrs.
I	The writing process: Gathering, writing, reviewing, editing, indexing testing etc.	7
II	Review writing, Repot Writing, Précis writing, Paragraph writing, business overviews	7
III	Letter writing: letter of inquiry. Letter of adjustment. Claim letter. Follow-up letter. Letter of acceptance. Letter of refusal	6
IV	Job-search correspondence: Including cover letter and curriculum vitae, Resume	5
V	Writing emails User guides reference guides Online help and websites. Technical Proposal writing	5
	Total	30

Reference Books:

1. Business communication and organization and management, C.B.Gupta (Suttan Chand & Sons Educational Publisher).
2. Essential English grammer & composition, James Thoms Pec Chaatt (Holly Faith International)
3. Business Comunication, John M. Penrose (Cengaqe Learning)
4. Write Better; Speak Better, Reader's Digest
5. Bussines Communication, R.C.Bhatia (Ane books Pvt. Ltd., New Delhi)

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BCA206: Environmental Studies **(L, T, P) = 3(3+0+0)**

Unit	Contents of Course	Hrs.
I	**Man & Environment:** Definition of Environment & its various components. Ecosystem concepts. Dependence of Man on nature for its various various needs. Human population growth & its impacts on environment. Environment & human health. Environmental concerns including climate change, Global warming, Acid Rain, Ozone layer Depletion etc. Environmental ethics. Traditional ways of utilising various components of environment. Sustainable developments.	7
II	**Natural Resources: Forest** resources, Mining, Dams & their effects on forests & tribal people. Water resources-over utilization of water, floods, droughts and conflicts over water resources. Mineral Resources- Use of various minerals for Human welfare & environmental effects of mining. Food resources -World food problem. Impacts of changing Agriculture practices on Environment. Energy Resources-Renewable and non renewable energy Resources & exploration of alternative energy sources. Land Resources- land degradation, soil erosion, and desertification & soil contamination.	7
III	**Ecosystems:** Structure & function, energy flow, food chains, food webs, Ecological pyramids. Basics of forest grasslands, desert & aquatic ecosystem (Ponds, Streams, Lakes, Rivers, Oceans & Estuaries)	8
IV	**Biological Diversity: Genetic**, species & ecosystem diversity, Values of Biodiversity, Global, National & Local Biodiversity. Hot-spots of Biodiversity, threat to biodiversity. Endangered & endemic species of India. Conservation of biodiversity in situ & ex-situ	7
V	**Environment pollution: Causes**, effects & control of- Air pollution, Water pollution, Soil pollution, Noise Pollution, Thermal pollution & Nuclear Hazards. Solid wastes & their Management. Disaster Management-Flood, Drought, Earthquake, Landslides etc.	7
	Total	36

Reference Books:

1. Agarwal KC, 2001. Environmental Biology, Nidi Publishers Ltd. Bikaner.
2. Bharucha Erach, 2003. The Biodiversity of India, Mapin Publishing Pvt. Ltd, Ahmedabad – 380013.
3. Brunner RC, 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480pgs.
4. Clark RS, Marine Pollution, Clanderson Press, Oxofrd (TB).
5. Cunningham WP, Cooper TH, Gorhani E & Hepworth MT, 2001. Environmental Encyclopedia,
6. Jaico Publishing House, Mumbai, 1196pgs.
7. De AK, Environmental Chemistry, Wiley Eastern Ltd.
8. Down to Earth, Center for Science and Environment (R)

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BCA207: DTP & Multimedia Lab **(L, T, P) = 3(+0+3)**

S.No.	List of Experiment	Hrs.
I	Create resume in html language.	3 hrs Weekly
II	Create list of sports celebrities in order list.	
III	Create a program to show a picture.	
IV	Create list of sports celebrities in unordered list.	
V	Create buttons (checkbox, radio button etc) in html.	
VI	Create a program of hyperlink in html.	
VII	Create a program in html to link up a picture, a word file & a text. File	
VIII	Create a rectangle in dream weaver.	

YEAR: I **SEMESTER: II**

BCA208: Internet Programming Lab **(L, T, P) = 3(+0+3)**

S.No.	List of Experiment	Hrs.
I	Create a biodata of self using HTML with a photograph on the page and containing marks in a table.	3 hrs Weekly
II	Develop your web page with the following properties. 2 Photographs display at the same place flip on mouse over. Link to separate HTML file for academic, sports and other interests.	
III	Enhance your wep page using style sheets frams and setup a hyper link to your friends page.	
IV	And 5 Make a form for submission of Querying about the interest rates of bank (use Text fields of HTML) and submit buttons of HTML.	
V	Make a local query form, which takes in the input the range of marks through Text fields (of Java) and display the list of students having marks in that range in another window.	
VI	Enchance the above query through password protection.	
VII	Build a shoping Cart page in which items of 10 types are picked and quantity and a bill is gererated by the wep page.	
VIII	Enchance the above page for making a payment through electronic billing system.	
IX	Associate guest book in your web page.	

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BCA209: Tally Lab **(L, T, P) = 3(+0+3)**

S.No.	List of Experiment	Hrs.
I	Introduction to Tally	3 hrs Weekly
II	Groups, Ledgers, Vouchers, Orders, cost centers and categories	
III	Stock in Tally - Creating a stock group - Displaying a stock group -Creating multiple stock groups -Displaying multiple stock groups	
IV	-Creating a godoun -Displaying a single godoun -Creating multiple godouns -Displaying multiple godoun	
V	Report in Tally -Displaying the detailed view of the day book report - Trial balance -Ratio analysis - Balance sheet	

YEAR: I **SEMESTER: II**

BCA210: Communication & Soft Skill Lab – II **(L, T, P) = 3(+0+3)**

S.No.	List of Experiment	Hrs.
I	Practice for communication skill and per market standard	4 hrs Weekly
II	Weekly group discussion	
III	Presentation skill development	

Reference Books:

1. Essential English grammer & composition, James Thoms Pec Chaatt (Holly Faith International).
2. Business Comunication, John M. Penrose (Cengaqe Learning).
3. Write Better; Speak Better, Reader's Digest.

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BCA301: Numerical Analysis **(L, T, P) = 4 (3+1+0)**

Unit	Contents of Course	Hrs.
I	Number system: types of number system, floating point arithmetic representation of floating point numbers, Operations, normalization, Errors in numerical computation. Iterative Methods: Zeros of a single transcendental equation and zeros of polynomial using Bisection Method, Iteration Method, Regula-Falsi method, Newton Raphson method, Secant method.	6
II	Simultaneous Linear Equations: Solutions of system of Linear equations, Gauss Elimination direct method and pivoting, Conditioned system of equations, Inversion matrix method, Refinement of solution. Gauss Seidal iterative method.	7
III	Interpolation with equal intervals: Finite Differences, Difference tables, Polynomial Interpolation: Newton's forward and backward formula, Central Difference Formulae: Gauss forward and backward formula, Stirling's, Bessel's formula.	8
IV	Interpolation with unequal intervals: Langrange's Interpolation, Newton Divided difference formula. Numerical Differentiation and Integration: Introduction, Numerical Differentiation, Numerical Integration, Trapezoidal rule, Simpson's rules, Weddle's Rule.	7
V	Solution of differential equations: Picard's Method, Euler's Method, Taylor's Method, Runge- Kutta methods, Predictorcorrector method, Automatic error monitoring, stability of solution etc.	8
	Total	36

Reference Books:

1. S. S Sastry: Introduction to Numerical methods: PHI Learning
2. Jain Iyenger, Jain:Numerical methods for scientific and engineering computation, New Age International Publication
3. Numerical Analysis: Biswal: PHI Learning

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BCA302: Object Oriented Programming & C++ **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	Introduction to OOPs and C++ Element - Introduction to OOPs, Features & Advantages of OOPs, Different element of C++ (Tokens, Keywords, Identifiers, Variable, Constant, Operators, Expression, String).	7
II	Program Control Statements – Sequential Constructs, Decision Making Construct, Iteration / Loop Construct, Arrays, Functions (User defined Function, Inline Function, Function Overloading), User Defined Data Types (Structure, Union and Enumeration).	7
III	Class, Object, Constructor & Destructor – Class, Modifiers (Private, Public & Protected), Data Member, Member Function, Static Data Member, Static Member Function, Friend Function, Object, Constructor (Default Constructor, Parameterized Constructor and Copy Constructor), Destructor.	7
IV	Pointer, Polymorphism & Inheritance – Pointer (Pointer to Object, this Pointer, Pointer to Derive Class), Introduction to Polymorphism (Runtime Polymorphism, Compile time Polymorphism), Operator Overloading, Virtual Function, Inheritance (Single Inheritance, Multiple Inheritance, Multilevel Inheritance, Hierarchical Inheritance, Hybrid Inheritance), Virtual Base Class, Abstract Class	8
V	File Handling, Exception Handling - Files I/O, Exception Handling (Exception Handling Mechanism, Throwing Mechanism, Catching Mechanism, Re-throwing an Exception).	6
	Total	35

Reference Books:

1. Object oriented programming with C++ by E. Balaguruswami
2. Success with C++ by Kris James
3. Object oriented programming with C++ by David Parsons
4. Programming in C++ by D. Ravichandran
5. Mastering C++ by Venugopal, Ravishankar, Rajkumar

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BCA303: System Analysis & Design **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	System Concept: Definition, Characteristics, Elements of system, Physical and abstract system, open and closed system, manmade information systems. System Development Life Cycle: Various phases of system development, Considerations for system planning and control for system success. System Planning.	7
II	Initial Investigation: Determining user's requirements and analysis, fact finding process and techniques. Feasibility study: Determination of feasibility study, Technical, Operational & Economic Feasibilities, System performance constraints, and identification of system objectives, feasibility report. Cost/Benefit Analysis of the new/proposed system	7
III	Structured Analysis: Tools of System Analysis. Structured Design: Tools of System Design with I/O and Form Design.	7
IV	Documentation for the new system: User Manual, system development manual, programming manual, programming specifications, operator manual. System testing & quality: System testing and quality assurance, steps in system implementation and software maintenance.	8
V	System security: Data Security, Disaster/ recovery and ethics in system development, threat and risk analysis. Hardware and software procurement – In-house purchase v/s hiring and lease	6
	Total	35

Reference Books:

1. System Analysis & Design by V K Jain, Dreamtech Press
2. Modern System Analysis & Design by A Hoffer, F George, S Valaciah Low Priced Edn. Pearson Education.

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BCA304: Software Engineering-I **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	Introduction to Software Engineering: Introduction, Definitions of Software Engineering, Program V/s. Software, Software Characteristics, Software Components, Software Applications, Software Crisis, Software Processes, Software Quality Attributes, Key challenges faced by the Software Engineering, Software Engineer, SDLC, Software System Development Methodologies, Project Management and Matrices, CASE tools	6
II	Software Project Management: Project Management Process, Feasibility Study, Software Project Planning, Project Execution, Monitoring and Control, Project Termination Analysis, SCM, Process Management Process, CMM, QIP, GQM, ISO 9000, Risk Management Process, Software Project Planning, SPMR, Scheduling a Software Project, Work Breakdown Structure, Activity Chart, Critical Path Method, Gantt Chart, Project Evaluation Review Technique	7
III	Requirement Engineering: Introduction to Requirement Engineering, Functional Requirements, Non-Functional Requirements, Domain Requirements, Requirement Engineering Process, Software Requirements Specification (SRS)	7
IV	Structured Analysis & Design: Data Modeling, Data Objects, Attributes And Relationships, Cardinality And Modality, Entity – Relationship Diagram, Functional Modeling, Data Flow Diagram, Logical And Physical DFDs, Leveling Of DFDs, Control Flow Diagram, Behavioral Modeling, Data Dictionary, Structured English, Decision Trees, Decision Table, Software Design Model, Conceptual and Technical Designs, Characteristics of a Good Design, Design Principles, Design Guidelines, Decomposition and Modularity	8
V	Quality Assurance Activities: Types of Quality Assurance Activities , Verification and Validation, Testing, Testing Fundamentals, Strategic Issues in Testing, Test Plan, Testing Principles, General Testing Strategies, Code Testing, Specification Testing, Black Box Testing, White Box Testing, Testing Process	6
	Total	34

Reference Books:

1. Oehm B. W., A Spiral Model of Software Development and Enhancement, IEEE Computer, 21.pp 61-72, May 1988.
2. Fairley R., Software Engineering Concepts, McGraw Hill, New York, 1985.
3. C. Banerjee, Software Engineering, Genius Publications, 2009
4. Gill N.S., Software Engineering: Software Reliability, Testing and Quality Assurance, Khanna Book Publishing Co (P) Ltd, New Delhi, 2002
5. Sabharwal S., Software Engineering: Principles, Tools and Techniques, Second Ed., Umesh Publications, Delhi, 2005.

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BCA305: Digital Electronics **(L, T, P) = 4 (3+1+0)**

Unit	Contents of Course	Hrs.
I	Number systems and different types of number systems,1's & 2's complement, Binary Fixed- Point Representation, Arithmetic operation on Binary numbers, Overflow & underflow, Floating Point Representation, ASCII, EBCDIC codes, Gray code, Excess-3 & BCD	6
II	Logic Gates, AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates, Boolean Algebra, Basic Boolean Law's, Demurrage's theorem, MAP Simplification, Minimization techniques, K -Map, Sum of Product & Product of Sum.	8
III	Combinational & Sequential circuits, Half Adder & Full Adder, Full subtract or Binary serial and parallel adders. BCD adder. Binary multiplier. Decoder: Binary to Gray decoder, BCD to decimal, BCD to 7-segment decoder.	7
IV	Flip-flops - RS, D, JK & T Flip-flops, RAM and ROM, Multiplexer, Demultiplexer, Encoder, Octal to binary, BCD to excess-3 encoder. Decoder, Idea about Arithmetic Circuits, Program Control, Instruction Sequencing.	7
V	Counters, Asynchronous (ripple), synchronous and synchronous decade counter, Modulus counter, skipping state counter, counter design. Ring counter. Counter applications. Registers: buffer register, shift register	8
	Total	36

Reference Books:

1. BARTEE**,** "Digital Computer Fundamentals" TMH Publication ISBN 0-07-003899-6
2. MALVINO**,** "Digital Computer Electronics" TMH Publication ISBN 0-07-462235-8
3. MORRIS MANO**,** "Computer System Architecture" PHI Publication ISBN 81-203-0417-9

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BCA306: Management Information System **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	Introduction, MIS concept, Definition, role & Impact of MIS, Process of management, organization structure & behavior.	6
II	Basic of Management Information System Decision Making, Information concepts, System concepts & control Types of system handling system complexity System development model	7
III	Development of Management Information System Requirement and implementation of MIS, Choice of information Technology for Management Information System.	7
IV	Application of Management Information system Application in manufacturing sector using for personal management, financial management, Production Management, Material Management, Marketing Management Application in Service Sector.	8
V	Enterprise Resource Planning (ERP), EMS, ERP, Benefits implementation, EMS & MIS. Case Studies- Application of SAPTMtechnoligies in manufacturing sector	6
	Total	34

Reference Books:

1. W.S. Jawadekar-Management Information System, Tata McGraw Hill.
2. Loudon & Loudon-Management Information, Pearson Education Asia

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BCA307: Object Oriented Programming & C++ Lab **(L, T, P) = 3(+0+3)**

S.NO.	List of Experiment	Hrs.
I	Write a program to perform the complex arithmetic.	
II	Write a program to perform the rational number arithmetic.	
III	Write a program to perform the matrix operations (Transpose, addition, subtraction, multiplication).	
IV	Implement Morse code to text conversion and vice-versa.	
V	To calculate GCD of given numbers.	
VI	To implement Tower of Hanoi problem.	**3 hrs Weekly**
VII	To implement spell checker using dictionary.	
VIII	To implement a Color selector from a given set of colors.	
IX	To implement a shape selector from a given set of shapes.	
X	By mapping keys to pens of different colours, implement Turtle graphics.	
XI	To implement a calculator with its functionality.	
XII	To implement a graph and display BFS/DFS order of nodes.	

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BCA308: Digital Electronics Lab **(L, T, P) = 3(+0+3)**

S.NO.	List of Experiment	Hrs.
I	To verify the truth tables of basic logic gates: AND, OR, NOR, NAND, NOR. Also to verify neither truth table of Ex-OR, Ex-NOR (For 2, 3, & 4 inputs using gates with 2, 3, & 4 inputs).	**3 hrs Weekly**
II	To verify the truth table of OR, AND, NOR, Ex-OR, Ex-NOR realized using NAND & NOR gates.	
III	To realize an SOP and POS expression.	
IV	To realize Half adder/ Subtractor & Full Adder/ Subtractor using NAND & NOR gates and to verify their truth tables.	
V	To realize a 4-bit ripple adder/ Subtractor using basic Half adder/ Subtractor & basic Full Adder/ Subtractor	
VI	To verify the truth table of 4-to-1 multiplexer and 1-to-4 demultiplexer. Realize the multiplexer using basic gates only. Also to construct and 8-to-1 multiplexer and 1-to-8 demultiplexer using blocks of 4-to-1 multiplexer and 1-to-4 demultiplexer	
VII	Using basic logic gates, realize the R-S, J-K and D-flip flops with and without clock signal and verify their truth table	
VIII	Construct a divide by 2,4 & 8 asynchronous counter. Construct a 4-bit binary counter and ring counter for a particular output pattern using D flip flop.	

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BCA309: Software Engineering Lab **(L, T, P) = 3(+0+3)**

S.NO.	List of Experiment	Hrs.
I	Write a program to count non blank lines with multi line, single line, half line and documentation (only in java) comments	3 hrs Weekly
II	Write a program to count global, external variables and their size (i.e. no of characters) and go to statements	
III	Write a program to analyze whether every line of code can be statically determined or not	
IV	Write a program to check it brackets and loops are properly in dented or not. If not then output indented program	
V	Write a program to count recursive and non recursive program and how many places the functions are called	
VI	Extend the program in Expt. 5 to determine the level of recursion and estimate the size of stack required	
VII	Generate the function wise report consisting. Function type-recursive/non recursive Parameter names and types Return types Global variables used Public/private/protested type variable/methods and over loaded methods. (In C++/Java only)	
VIII	Estimate the space required by the program.	
IX	Estimate the time required for execution in the program.	
X	Implement a TSR program.	
XI	Write a program to test Keyboard/Monitor services, using system interrupts.	
XII	Write a program to test Keyboard/Monitor serviced without using system interrupts	

YEAR: II **SEMESTER: III**

BCA310: Advance Programming Lab **(L, T, P) = 3(+0+3)**

	List of Experiment	Hrs.
	The experiment will be based on the topic to covered in the syllabus	3 hrs Weekly

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YEAR: II **SEMESTER: IV**

BCA401: Software Engineering-II **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	**Software Project Estimation and Decomposition Techniques:** Software Decomposition, Software Decomposition Techniques, Software Sizing, Problem based estimation, Process-based estimation, Empirical Estimation Techniques, Heuristic Estimation Techniques, COCOMO, Analytical Estimation Techniques, Function Point Analysis	8
II	**Object Oriented Analysis:** The object–oriented paradigm, Object–Oriented Concepts, Classes and Objects, Attributes, Methods, Messages, Abstraction, Data Encapsulation,. Inheritance, Polymorphism, Dynamic Binding, Function Overriding, Operator Overloading, Message Communication, Object–Oriented Analysis, Domain Analysis, Use Cases, Class–Responsibility–Collaborator Modeling, Classification and Assembly Structures, Defining Subjects, Instance Connections & Message Paths, OOA and Prototyping, The Object–Relationship Model, The Object–Behavior Model	7
III	**Design:** Abstraction, Stepwise Refinement, Software Architecture, Control Hierarchy, Data Structure, Software Procedure, Structural Partitioning, Information Hiding, Software Design Process, Effective Modular Design, Module Types, Functional Independence, Cohesion, Coupling, Effective Modular Design Heuristics, Data Design, Architectural Design, Procedural Design, Design Documentation,	6
IV	Programming and Quality Assurance Activities: Fundamentals of Software Programming, Internal Documentation, Code Verification and Validation Techniques, Code Monitoring & Control Activities, Black Box testing, White Box testing methods	6
V	Software Maintenance and Re-engineering: The Maintenance Process, Type of Maintenance, Corrective Maintenance, Adaptive Maintenance, Perfective Maintenance, Preventive Maintenance, Maintenance Costs, Measuring Effectiveness, Controlling Maintenance Requests, Software Re-engineering Process	7
	Total	34

Reference Books:

1. Roger S. Pressman-fifth Edition, Mc-Graw hill Publications.
2. Ali Behforooz and frederick J. Hudson Oxford Press 1998.
3. Ian Sommerville-Software Engineering, Pearson Education India

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BCA402: Database Management System **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	Overview of DBMS, Basic DBMS terminology, data base system v/s file system, data independence. Architecture of a DBMS.	6
II	Introduction to data models: entity relationship model, hierarchical model: from network to hierarchical, relational model, comparison of network, hierarchical and relational models.	8
III	Data modeling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree.	7
IV	Relational model: storage organizations for relations, relational algebra, relational calculus. Normalization: Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependencies, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.	8
V	Introduction to SQL: Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators and their procedure, Transaction Manager, Recovery, Concurrency control	6
	Total	35

Reference Books:

1. Database Management Systems by Raghu Ramakrishnan
2. Fundamentals of Database Management Systems by Mark L. Gillenson
3. Database System Concepts by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan
4. Database Systems: Design, Implementation, and Management by Peter Rob and Carlos Coronel
5. Database Systems: The Complete Book (2nd Edition) by Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer Widom

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BCA403: Programming in Visual Basic **(L, T, P) = 4 (3+1+0)**

Unit	Contents of Course	Hrs.
I	Object model, Visual Basic Environment Visual Basic Code Statements, Controls, Coding for the controls, variables, constants and calculations, decision control structure	6
II	Loop control structure, nested Ifs statements, Input validations, Calling event procedures, Menus, Sub Procedures and Sub Functions, Multiple forms, Variables and Constants in Multiple Form Projects List Boxes and Combo Boxes, Using Mfg Box and String Function	8
III	Arrays, using List Boxes and Arrays, Multidimensional Arrays, Classes, initializing and terminating events, Collections, using the Object browser	7
IV	Data Files, Sequential File Organization, Random Data Files. Accessing Database files, Navigating the database in Code, Displaying Data in Grids, Validation and Error Trapping	8
V	Dragging and Dropping Multiple Objects, Graphics, Layering, Simple Animation, Active X, Dynamic Link Libraries, Object Linking and Optimizing VB Code, OLE Automation and VBA, automating Word, Excel and Outlook 98.	6
	Total	35

Reference Books:

1. Julin Case Bradley and Anita C. Millspaugh: Programming in Visual Baisc 6.0, Tata Mc Graw Hill.
2. Dan Rahmel: Visual Basic 6, Tata Mc Graw Hill.
3. Wayne S. Freeze : Visual Baic 6, BPB Publications

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BCA404: Data Structure & Algorithm **(L, T, P) = 4 (3+1+0)**

Unit	Contents of Course	Hrs.
I	The concept of data structure, Abstract data type, Concept of list & array Introduction to stack, Stack as an abstract data type, primitive operation on stack, Stacks application: Infix, post fix, Prefix and Recursion, Multiple Stack. Introduction to queues, Primitive Operations on the Queues, Queue as an abstract data type, Circular queue, Dequeue, Priority queue, Applications of queue	8
II	Introduction to the Linked List , Basic operations on linked list, Stacks and queues linked list, Header nodes, Doubly Linked List, Circular Linked List, Stacks & Queues as a Circular Linked List, Application of Linked List	7
III	TREES - Basic Terminology, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary tree, Traversal of binary trees:- In order, Preorder & post order, Application of Binary tree, Threaded binary tree, B-tree & Height balanced tree, Binary tree representation of trees	7
IV	Analysis of algorithm, complexity using big 'O' notation. Searching: linear search, Binary search, their comparison. Sorting: Insertion sort, Selection sort, Quick sort, Bubble sort, Heap sort, Comparison of sorting methods. Hash Table, Collision resolution Techniques	8
V	Introduction to graphs, Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, Graph Traversal-Depth first & Breadth first search. Spanning Trees, minimum spanning Tree, Shortest path algorithm	7
	Total	37

Reference Books:

1. Fundamentals of Data Structure, By S. Sawhney & E. Horowitz
2. Data Structure: By Trembley & Sorrenson
3. Data Structure: By lipschuists (Schaum's Outline Series Mcgraw Hill Publication)
4. Fundamentals of Computer Algorithm: By Ellis Horowitz and Sartaj Sawhney

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BCA405: E-Commerce **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	Introduction: Motivation, Forces behind E-Commerce Industry Framework, Brief history of ECommerce, Inter Organizational E-Commerce Intra Organizational E-Commerce, and Consumer to Business Electronic Commerce, Architectural framework, Network Infrastructure for E-Commerce Network Infrastructure for ECommerce, Market forces behind I Way, Component of I way Access Equipment, Global Information Distribution Network, Broad band Telecommunication.	6
II	Mobile Commerce: Introduction to Mobile Commerce, Mobile Computing Application, Wireless Application Protocols, WAP Technology, Mobile Information Devices, Web Security, Introduction to Web security, Firewalls &Transaction Security, Client Server Network, Emerging Client Server Security Threats, firewalls & Network Security.	8
III	Encryption: World Wide Web & Security, Encryption, Transaction security, Secret Key Encryption, Public Key Encryption, Virtual Private Network (VPM), Implementation Management Issues.	7
IV	Electronic Payments: Overview of Electronics payments, Digital Token based Electronics payment System, Smart Cards, Credit Card I Debit Card based EPS, Emerging financial Instruments, Home Banking, Online Banking.	8
V	Net Commerce: EDI, EDI Application in Business, Legal requirement in E -Commerce, Introduction to supply Chain Management, CRM, issues in Customer Relationship Management.	6
	Total	35

Reference Books:

1. David Whiteley-E-Commerce Strategy, Technology and Applications, Tata McGraw Hill.
2. Mathew Reynolds-Beginning E-commerce with visual Basic ASP, SQL Server 7.0 and MTS,
3. Shroff Publishers & Distributors Pvt. Ltd.
4. Perrone & Chaganti-Building Java Enterprise Systems with J2EE, Techmedia.
5. Kalakota-Frontiers of Electronic Commerce, Pearson Education

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BCA406: Information Security **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	Introduction: Attacks, services and Mechanism, security attacks, security Services, model for Internet work security Conventional Encryption: Principles, algorithms, cipher block modes of operation, location of encryption devices, key distribution.	6
II	Public Key Cryptography: Approaches to message authentication, secure Hash function & HMAC, public key cryptography principles, algorithms, digital signature, key management. Authentication Applications Kerberos, X 509 Directory authentication service.	8
III	IP Security : Overviews ,Architecture ,Authentication header .Encapsulating security payload, Combining security associations ,key manangent Web Site : Requirement ,Secure Sockets Layer (SSL) & Transport Layer Security (TLS), Secure Electronic Transaction (SET)	7
IV	Intruders ,Viruses & Firewall : Intruders , Viruses & related threats Firewall Design Principles ,Trusted Systems	8
V	E-Mail Security: Pretty Gard Privacy (PGP) & S/MIME.	6
	Total	35

Reference Books:

1. Stallings -Network Security Essentials ,Pearson Eduction Asia , 2003
2. Nick Galbreath -Cryptography for database and Internet applications, Wiley-Dreamtech, 2002
3. Stallings - Cryptography & Network Security ,Pearson Eduction Asia , 2nd Ed.

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BCA407: Database Lab **(L, T, P) = 3(+0+3)**

S.No.	List of Experiment	Hrs.
I	(a) Write a C++ program to store students records (roll no, name, father name) of a class using file handling.(Use C++ and File handling). (b) Re-write program 1, using any DBMS and any compatible language.(C++/MySQL) (VB and MS-Access)	**3 hrs Weekly**
II	Database creation/ deletion, table creation/ deletion. (a) Write a program to take a string as input from user. Create a database of same name. Now ask user to input two more string, create two tables of these names in above database. (b) Write a program, which ask user to enter database name and table name to delete. If database exist and table exist then delete that table	
III	Write a program, which ask user to enter a valid SQL query and display the result of that query	
IV	Write a program in C++ to parse the user entered query and check the validity of query. (Only SELECT query with WHERE clause)	
V	Create a database db1, having two tables t1 (id, name, age) and t2 (id, subject, marks). (a) Write a query to display name and age of given id (id should be asked as input). (b) Write a query to display average age of all students. (c) Write a query to display mark-sheet of any student (whose id is given as input). (d) Display list of all students sorted by the total marks in all subjects.	
VI	Design a Loan Approval and Repayment System to handle Customer's Application for Loan and handle loan repayments by depositing installments and reducing balances	
VII	Design a Video Library Management System for managing issue and return of Video tapes/CD and manage customer's queries.	

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BCA408: Visual Basic Lab **(L, T, P) = 3(+0+3)**

S.NO.	List of Experiment	Hrs.
I	Five experiments based on the following topics: Object model, Visual Basic Environment Visual Basic Code Statements, Controls, Coding for the controls, variables, constants and calculations, decision control structure	**3 hrs Weekly**
II	Five experiments based on the following topics: Loop control structure, nested Ifs statements, Input validations, Calling event procedures, Menus, Sub Procedures and Sub Functions, Multiple forms, Variables and Constants in Multiple Form Projects List Boxes and Combo Boxes, Using Mfg Box and String Function	
III	Five experiments based on the following topics: Arrays, using List Boxes and Arrays, Multidimensional Arrays, Classes, initializing and terminating events, Collections, using the Object browser	
IV	Five experiments based on the following topics: Data Files, Sequential File Organization, Random Data Files. Accessing Database files, Navigating the database in Code, Displaying Data in Grids, Validation and Error Trapping	
V	Five experiments based on the following topics: Dragging and Dropping Multiple Objects, Graphics, Layering, Simple Animation, Active X, Dynamic Link Libraries, Object Linking and Optimizing VB Code, OLE Automation and VBA, automating Word, Excel and Outlook 98.	

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BCA409: Data Structure Algorithm Lab **(L, T, P) = 3(+0+3)**

S.NO.	List of Experiment	Hrs.
I	Program on array searching, sorting (Bubble sort, Quick sort, Marge sort etc.)	3 hrs Weekly
II	Program to insert element at desire position, replacing element, deletion in array.	
III	Various matrices operations.	
IV	Addition, multiplication and transpose of sparse matrices represented in array form.	
V	Addition, multiplication and transpose of sparse matrices represented in linked list form.	
VI	Polynomial addition, multiplication (8th degree polynomials).	
VII	Implementation of stack and queue using link lists.	
VIII	Implementation of circular queue using link lists.	
IX	Polynomial addition, multiplication.	
X	Two-way link lists programs.	
XI	Infix to postfix/prefix conversion.	
XII	BST implementation (addition, deletion, searching).	
XIII	Graph traversal (BFS, DFS).	

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BCA410: INFORMATION SECURITY LAB **(L, T, P) = 3(+0+3)**

	List of Experiment	Hrs.
	The experiment will be based on the topic to covered in the syllabus	3 hrs Weekly

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BCA501: Fundamentals of Operating System **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	Introduction: Definition and types of operating systems, Batch Systems, multi programming, time–sharing parallel, distributed and real-time systems, Operating system structure, Operating system components and services, System calls, system programs, Virtual machines.	7
II	Process Management: Process concept, Process scheduling, Cooperating processes, Threads, Inter-process communication, CPU scheduling criteria, Scheduling algorithms, Multiple-processor scheduling, Real-time scheduling and Algorithm evaluation.	7
III	Process Synchronization and Deadlocks: The Critical-Section problem, synchronization hardware, Semaphores, Classical problems of synchronization, Critical regions, Monitors, Deadlocks-System model, Characterization, Deadlock prevention, Avoidance and Detection, Recovery from deadlock, Combined approach to deadlock handling.	8
IV	Storage management: Memory Management-Logical and Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation with paging, Virtual Memory, Demand paging and its performance, Page replacement algorithms, Allocation of frames, Thrashing, Page Size and other considerations, Demand segmentation, File systems, secondary Storage Structure, File concept, access methods, directory implementation, Efficiency and performance, recovery, Disk structure, Disk scheduling methods, Disk management, Recovery, Disk structure, disk scheduling methods, Disk management, Swap-Space management, Disk reliability.	8
V	Protection and Security-Goals of protection, Domain of protection, Access matrix, Implementation of access Matrix, Revocation of Access Rights, language based protection, The Security problem, Authentication, One Time passwords, Program threats, System threats, Threat Monitoring, Encryption. Case study : Windows NT-Design principles, System components, Environmental subsystems, File system, Networking and program interface.	8
	Total	38

Reference Books:

1. Tannenbaum, "Operating System Design and Implementation", PHI.
2. Gary Nutt, "Operating System, A Modern Perspective", Addision Wesley.
3. Stalling, Willium, "Operating System", Maxwell Macmillan
4. Silveschatza, Peterson J, "Operating System Concepts", Willey.

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BCA502: Programming in Java **(L, T, P) = 4 (3+1+0)**

Unit	Contents of Course	Hrs.
I	Overview of Object Oriented Concepts in Java. Introduction Java & internet, Java applets and its applications, Java features like security, portability, byte code, java virtual machine, object oriented, robust, multithreading, architectural neutral, distributed and dynamic	7
II	Data types and control structures, operators, array, Java methods and classes. Inheritance of procedures and Data, packages and interface, exception handling, multithreaded programming thread priorities, synchronization, messaging, creating and controlling of threads. I/O and applets. String handling and various string functions	7
III	Java utilities like java.lang, java.util and their uses, java.io, basics of networking using Java. Java applets and their use – Event Handling – AWT and working with Windows – Event Handling – Event Handling Mechanisms, Delegation Event Model, Event Class, Event Listener Interfaces, Adapter Classes, Inner Class. AWT and working with windows – AWT	8
IV	Classes, Window fundamentals, frame windows, frame window in An Applet, Working with Graphics, color, fonts and text. Java Beans – BDK, JAR files, Introspection, Developing simple bean using BDK, Bound Properties, Bean Info, Interface, Constrained properties, Persistence, Customizes Servlets - Life cycle of servlet, use of tomcat for servlet, servlet API, Javax.Servlet package, servlet parameters, Javax.Servlet.http package, Handling HTTP requests and Responses, Cookies	8
V	JDBC – JDBC API, JDBC Drivers, Products, JDBC Design considerations, Two Tier and Three Tier client server model, Basic steps to JDBC, setting up a connection to database, Creating and executing SQL statements, Result set and Result set Meta Data Object	7
	Total	37

Reference Books:

1. Java 2 Computer Reference (Tata McGraw Hill)
2. Core Java-I (Addison Wesley) - horstmann
3. Core Java - II (Addison Wesley)
4. Thinking in Java (Bruce Eckel)

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BCA503: Data Communication & Networking **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	Overview, evolution of computer networks, computer telephony. Data communications – advantages of digital communication, transmission media, fundamentals of digital communications, transmission media, modulation techniques and modems.	7
II	The OSI seven layer network model, LAN technologies – protocols and standards, LAN hardware, TCP/IP and the Internet, Internet Architecture, Internet protocol and data grams., Routing protocols, UDP, Internet standard services, DNS.	7
III	Networking Technologies, ISDN, Cable Modem System, DSL, SMDS, Frame relay, fast Ethernet, 100VG-anyLAN and Gigabit Ethernet, FDDI and CDDI, Asynchronous Transfer, SONET, DWDM.	7
IV	Switching and Virtual LAN, Non-ATM Virtual LANs, IEEE 802.1Q VLAN standard, Network Performance, Analytical approaches, simulation, traffic monitoring. Network Management – SNMP, RMON and RMNv2, T MN, Directory services and network management.	8
V	Issues related to network reliability and security, SSL and VPN, Introduction only to firewalls and Kerberos, Cyber Laws.	6
	Total	35

Reference Books:

1. Data Communications and Networking (McGraw-Hill Forouzan Networking) by Behrouz A. Forouzan
2. Introduction to Data Communications and Networking by Wayne Tomasi
3. Networking and Data Communications by V. C. Marney-Petix

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BCA504: Web Designing **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	The internet: history of the world wide web, hardware and software trend, object technology – java script object, scripting for the web-browser portability.	6
II	Introduction of HTML: introduction, markup language, editing HTML : common tags, headers, text styles, linking, images, formatting text, horizontal rules and more line breaks, unordered lists, nested and ordered lists, basic HTML tables : intermediate HT ML tables and formatting : basic HTML forms, more complex HTML forms, internal linking, creating and using image maps.	7
III	Java script – introduction to scripting: introduction- memory concepts- arithmetic- decision making. Java script control structures, Java script functions: introduction – program modules in java script - function definitions, duration of identifiers, scope rules, recursion, java script global functions. Java script arrays: introduction, array-declaring and allocating arrays, references and reference parameters – passing arrays to functions, multiple subscripted arrays. Java script objects: introduction, math, string, data, Boolean and number objects.	8
IV	Dynamic HTML : CSS : introduction – inline styles, creating style sheets with the style element, conflicting styles, linking external style sheets, positioning elements, backgrounds, element dimensions, text flow and the box model, user style sheets. Dynamic HTML: object model and collections: introduction, object referencing, collections all and children, dynamic style, dynamic positioning, using the frames collection, navigator object. Dynamic HTML: event model : introduction, event ON CLICK, event ON LOAD – error handling with ON ERROR, tracking the mouse with event, more DHTML events. Filters and Transitions: Dynamical HTML: Client side scripting with VB script: Introduction - operators- data types and control structures – VB script functions – arrays –string manipulation classes and objects.	7
V	Introduction to PHP – Advantages of PHP – Functions – Data types – Arrays – SQL – Connecting Databases using ODBC – Files – Forms – Images –I map objects.	7
	Total	35

Reference Books:

1. Pro XML Development with Java Technology: From ... - by Ajay Vohra, Deepak Vohra

2. Information Technology and Economic Development - by Yutaka Kurihara, Sadayoshi Takaya, Hisashi

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BCA505: Computer Organization & Architecture **(L, T, P) = 4 (3+1+0)**

Unit	Contents of Course	Hrs.
I	Data Movement around registers, Data movement from/to memory arithmetic and logic micro operations. Concept of bus and timings in register transfer.	7
II	Addressing Modes, Instruction Format, CPU organization with large registers, stacks and handling of interrupts & subroutines Instruction pipelining.	7
III	Array multiplier Booth's algorithm, Addition/subtraction for signed/unsigned number and 2's complement number. Basic organization of micro programmed controller, Horizontal & Vertical formats, Address sequencer.	7
IV	Concept of RAM/ROM, basic cell of RAM, Associative memory, Cache memory organization, Vertical memory organization.	6
V	Introduction to Peripherals & their interfacing. Strobe based and handshake based communication, DMA based transfer, I/O Processor.	7
	Total	34

Reference Books:

1. J.P. Hayes-Computer Architecture & Organization, Mc-Graw Hill.
2. Heuring-Computer System Design and Architecture, Pearson Education.
3. M.Morrismanno-Computer System Architecture Prentice Hall of India.
4. Bartee-Computer Architecture, Tata Mc-Graw Hill.
5. Stallings-Computer Organization and Architecture Pearson Education

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BCA506: VB.NET **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser.	7
II	The VB.NET Language- Variables -Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Subroutines, Functions, Passing variable Number of Argument Optional Argument, Returning value from function. Control flow statements: conditional statement, loop statement. Msgbox & Inputbox.	7
III	Working with Forms : Loading, showing and hiding forms, controlling One form within another. GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar.There Properties, Methods and events. OpenFileDilog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog. Link Label. Designing menues : ContextMenu, access & shorcut keys.	8
IV	Object oriented Programming: Classes & objects, fields Properties, Methods & Events, constructor, inheritance. Access Specifiers: Public Private, Projected. Overloading, My Base & My class keywords.	7
V	Database programming with ADO.NET – Overview of ADO, from ADO to ADO.NET, Accessing Data using Server Explorer. Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound controls, display data on data grid.	7
	Total	36

Reference Books:

1. Vb.Net Programming Black Book By Steven Holzner –Dreamtech Publications
2. Mastering Vb.Net By Evangelos Petroutsos- Bpb Publications

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BCA507: Java Programming Lab **(L, T, P) = 3(+0+3)**

S.NO.	List of Experiment	Hrs.
1	Simulate a traveling guide which displays major cities of Rajasthan on screen and connecting roads, provide a facility to display shortest path between two cities and also a traveling salesman route.	3 hrs Weekly
2	Generate symbol table and perform lexical analysis of C program.	
3	Write a program to draw Circle/Rectangle/Triangle/Ellipse on screen and perform different transformation operation (Shift, rotate, resize) on the object created.	
4	Draw a rectangular box of size 4:3:2 and generate its different views.	
5	Animate a car on the screen such that when car moves its wheels rotates.	
6	Simulation of digital clock (display as 7-segment LED).	

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BCA508: Computer Networking Lab **(L, T, P) = 3(+0+3)**

S.NO.	List of Experiment	Hrs.
1	Write an echo client and server using socket.	3 hrs Weekly
2	Design a clock synchronization protocol.	
3	Build a client for the protocol.	
4	Build a domain name system client program.	
5	Build a DHCP client.	
6	Capture and decode Ethernet frames.	
7	Decode an IP header.	
8	Build a packet analyzer.	
9	Extract data from a TCP stream.	
10	Observe concurrent TCP connections.	
11	Extract data from a TCP stream	
12	Observe concurrent TCP connections	

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BCA509: Web Designing Lab **(L, T, P) = 3(+0+3)**

S.NO.	List of Experiment	Hrs.
1	Use of HTML tags Text formatting, text styles,	3 hrs Weekly
2	lists(ordered list and unordered list with nesting control)	
3	Tables with Rowspan and colspan	
4	Linking documents(hyper linking and image maps) linking to a particular location(within page, another page)	
5	Frames: use of frames set, targeting frames	
6	Preparation of the static website with the help of HTML tag	
7	CSS:In line,internal,external	
8	Use of the Java Script	
9	Use of the forms in HTML(buttons,text,drop down menu etc)	
10	Adding graphics to HTML documents	
11	Use of VB script	
12	Introduction to PHP	

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BCA510: Web Designing Lab **(L, T, P) = 3(+0+3)**

- Minor Project in VB.NET

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BCA601: ASP.Net using C# **(L, T, P) = 4 (3+1+0)**

Unit	Contents of Course	Hrs.
I	**Asp .Net Basics** - Understanding the .Net framework – principal, feature, design, gole, Benefits of .Net framework, Event Logging, Performance Counter, Tracing, CTS, CLS, CLR, .Net class library, GIT, Type of GIT, Assemblies - version, culture, strong name, Type of Assemblies, Metadata, Manifest, MSIL, Managed and Unmanaged code, Memory Management, Garbage Collection, Security, Reflection, WPF, WCF, Window Card Space, GAC, CASPOL, REGEN, ILASM, ILDASM. DLL HELL Problem, Page life cycle.	7
II	**Introduction Ado.NET** - Ado.Net Basics, Ado.Net object model, Ado.Net class for OLE DB data source, SQL Server, DataSet, Data View, Data Reader, Data Adapter, Data Table, Data Column, Data Row, Difference between Ado and Ado.Net, Communication with OLEDB data source using Ado.Net.	7
III	**Understanding Caching** - Overview, Introduction to Caching, Client dedicated server, Reverse proxy, Absolute expiration and Relative expiration, Http Cache Policy, HttpCacheability, @ Output Cache, HttpCacheVaryByParams, HttpCacheVaryByHeaders, CachingPageOutput, Data caching, PageFragment Caching, PageOutput caching.	8
IV	**State Management** - Client state management- View state, Hidden field, Cookies, QueryString Server state management- Application state, Session state, Advantage and Disadvantage of database support.	7
V	**Web Services and XML** - Introduction to xml, Advantage of xml, xml Element, Naming Rules, Attributes Introduction to web service, web service Infrastructure, SOAP, UDDI, WSDL.	7
	Total	36

Reference Books:

1. Beginning ASP.NET 3.5 in C# 2008: From Novice to Professional, Second Edition by Matthew MacDonald
2. ASP .NET Programming with C# & SQL Server (The Web Technologies) by Don Gosselin
3. Developing Web Applications with ASP.NET and C# by Hank Meyne and Scott Davis
4. Beginning ASP.NET 2.0 with C# (Wrox Beginning Guides) by Chris Hart, John Kauffman, David Sussman, and Chris Ullman

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BCA602: Open Source Technology **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	Open source technology (OST): Introduction, Evolution & development of OST and contemporary technologies, Factors leading to its growth, Free Software Foundation and the GNU Project, principle and methodologies. Applications of open source, Risk Factors, Myths regarding open source.	7
II	Philosophy of Software Freedom: Free Software, OSS, Closed software, Public Domain Software, Shared software, Shared source. Detail of few OSS like Open Audio, Video, 2d & 3d graphics software, system tools, office tools, Networking & internet, Security, Educational tools and Games.	8
III	Open Source Development Model: Starting and Maintaining an Open Source Project, Open Source Hardware, Open Source Design, Ongoing OS Projects. Case Study: - Linux, Wikipedia etc.	8
IV	Licenses of open source: What Is A License, How to create your own Licenses? Important FOSS Licenses (Apache, BSD, GPL, LGPL), copyrights and copy lefts.	7
V	Economics of FOSS: Social and Financial impacts of open source technology, Zero Marginal Cost, Income generation opportunities, Problems with traditional commercial software, Internationalization, Open Source as a Business Strategy.	7
	Total	37

Reference Books:

1. Embedded Linux Primer by Hallinan
2. Embedded Linux: Hardware, Software, and Interfacing by Hollabaugh
3. Linux Kernel Programming by Beck
4. Open Source Development with Lamp: Using Linux Apache, MySQL, Perl and PHP by LEE

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BCA603: Artificial Intelligence **(L, T, P) = 4 (3+1+0)**

Unit	Contents of Course	Hrs.
I	Intelligence: concept of intelligence, Artificial intelligence, areas of application. Search techniques, state space, Production rules, problem characteristics, production system characteristic, depth first, breadth first search methods and their analysis, Heuristic search method, generate and test, hill climbing, best first method.	7
II	Knowledge Representation: concept of knowledge, characteristics and representation schemes, Logic, prepositional and predicate calculus, resolution, semiotics nets, frames, conceptual dependency.	7
III	No monotonic Reasoning: default reasoning, minimalist reasoning, statistical reasoning – Bay's theorem, certainty factors, dumpsters Shafer theory, Fuzzy logic, Forward and Backward reasoning, logical reasoning etc.	7
IV	Learning: concept of learning, various techniques used in learning, inductive and deductive. Knowledge acquisition, rote learning, discovery and analogy.	7
V	Expert System: concept of expert system, need for an expert system, Component and categories of an expert system, Stages in the development of an expert system, application & future scope of expert system.	7
	Total	35

Reference Books:

1. Programming for Artificial Intelligence,:- by Prolog

2. Artificial Intelligence,:- by Rich &Night

3. Learning and Soft Computing: Support Vector Machines, Neural Networks, and Fuzzy Logic Models by Kecman

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BCA604: Linux fundamentals & Shell Programming **(L, T, P) = 4 (3+1+0)**

Unit	Contents of Course	Hrs.
I	Linux introduction and file system - Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell. Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories. Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces. Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down process, init and run levels.	8
II	Essential linux commands Understanding shells, Processes in linux-process fundamentals, connecting processes with pipes, tee, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron, batch commands, kill, ps, who, sleep, Printing commands, find, sort, touch, file, file related commands-ws, sat, cut, dd, etc. Mathematical commands-bc, expr, factor, units. Creating and editing files with vi, joe & vim editor	7
III	System administration Common administrative tasks, identifying administrative files – configuratinn and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, checking and monitoring system performance file security & Permissions, becoming super user using su. Getting system information with uname, host name, disk partitions & sizes, users, kernel. Backup and restore files, reconfiguration hardware with kudzu, installaing and removing packages with rpm command. Configure X-windows desktop-redhat-config-Xfree86, understanding XF86config file, starting & using X desktop. KDE & Gnome graphical interfaces, changing X settings.	8
IV	Shell programming- Basic of shell programming, Various types of shell available in Linux, comparisons between various shells, shell programming in bash, read command, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automate system tasks.	7
V	Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Flter using regular expressions – grep, egrep, and sed. awk programming – report printing with awk.	7
	Total	37

Reference Books:

1. UNIX – Concepts & Applications (Third Ed.) – Sumitabha Das, Tata McGraw Hill Publications.
2. Unix for programmers and users (Third Ed.) – Graham Glass & King Ables, Pearson Education India. (Low Prices Edition).
3. Red Hat Linux 9 Bible – Cristopher Negus, IDG Books India Ltd.

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BCA605: Principles of Programming Languages **(L, T, P) = 3 (3+0+0)**

Unit	Contents of Course	Hrs.
I	Introduction – Role of programming languages - Effects of Environments on languages – Language. Design issues – Virtual computers and binding times, Language Paradigms	7
II	Data types - Specification of data types, implementation of elementary data types, Declarations, type, checking and type conversion - Assignment and Initializations - Structured data types - Specification of, data structure types, Implementation of data structure type - Declarations and type checking for data structures	7
III	Abstract data types, Encapsulation by subprogram - Type definition, storage management – Sequence, Control - Implicit and Explicit sequence control, sequencing with arithmetic expressions, sequence, control between statements.	7
IV	Subprogram control - Subprogram sequence control, attributes of data control, Shared data in subprograms - Abstract data types revisited, Inheritance, Polymorphism	7
V	Advances in Language design - Variations of subprogram control, Parallel programming, Introduction to exception handling - Exception handling in JAVA, Hardware developments, software architecture.	7
	Total	35

Reference Books:

1. V.Rajaraman :Fundamentals of Computers
2. Ghezzi: Programming Language Concepts, Addison Wesley.
3. Kernighan, Ritchie :Programming in C
4. Structure :Programming in C++
5. Ravi Shetty:Programming Language

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BCA606: ASP .Net Lab using C# **(L, T, P) = 3(+0+3)**

S.NO.	List of Experiment	Hrs.
1	By using SQL Data source sow the record in Grid view, Detail View, Form view, Repeater and List view	**3 hrs Weekly**
2	By using SQL Data source put the record in the dropdown Manu than find the detail information of the selected item from the dropdown Manu	
3	By using North wind Database find out some of the unit in stock.	
4	Show the use of Eval and Bind property in the form view	
5	Create the master page and show the implementation in the aspx page.	
6	Create the Theme as blue theme or green theme and show the use of it.	
7	By using Ado.Net insert and Display the record.	
8	Show the use of SQL data reader class in Ado.Net.	
9	Create the DLL file and implement in the aspx page.	
10	Put the multiple values in the dropdown list1 select the particular information in dropdown list1 and find out different information in dropdown list2 related to DDL1	

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BCA607: Operating System Lab **(L, T, P) = 3(+0+3)**

S.NO.	List of Experiment	Hrs.
1	CPU simulator: Write a program to read mnemonics for 8085 CPU and produce appropriate machine language instruction.	3 hrs Weekly
2	Tape Drive simulator: Write a program to declare 512 kb portion of RAM memory as a Magnetic Tape Drive on which sequential file can be stored and accessed .Files are to be written as blocks of fixed or variable size. Make appropriate assumption about start time, stop time, tape speed ,load point and last point of tape.	
3	Floppy Disk Drive Simulator: Write a program to declare 512 kb portion of RAM memory as a double sided disk drive of 64 tracks 32 sectors per track of unformatted capacity. Format it to store at least 64 byte /sector of user data as sequential and /or random access files. Assume that both heads move together.	
4	File Manager: Write a file manager for above disk drive. It should maintain file directory, record of used/free sectors, good/bad(assumed) sectors .Create ,delete ,rename file/directories.	
5	Memory Manager: Write a memory manager for 64 kb of RAM memory for use with 8085 CPU for segmented memory management (fixed/ variable size segments.). At least one segment of 8kb must be reserved for O.S. and other may be given to users (max. 7 processor). Implement memory compaction .garbage collection and best fit/worst fit allocation schemes.	
6	Long Term Scheduler: Write a job analyzer to inspect incoming job, evaluate its system resource requirement and execution priority and schedule it for execution.	
7	Short Term Scheduler: Write a process scheduler allowing two different time quanta for CPU scheduling and I/O Scheduling in which process can change various states.	
8	Write a print scheduler which examine output file an schedules them for printing on a slow printer or fast printer to optimize the system throughput.	
9	Write a system call handler for creating, deleting and terminating (Normally/Abnormally) process.	
10	Write a interput handler for 8085.	

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BCA608: Seminar **(L, T, P) = 3(+0+3)**

- Technical Seminar

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BCA609: Major Project **(L, T, P) = 3(+0+3)**

S.NO.	List of Experiment	Hrs.
1	Major Project	6hrs Weekly