PRADESH UNIVERSITY
COMPUTER APPLICATIONS (BCA)
Effective from 2009 onwards

First Year

Paper No	Title	Periods Per Week (Theory/ Practical)	Max. Marks	Continual Internal Assessment	Exam Duration Hours
BCA-101	Mathematics-I	4	80	20	3
BCA-102	Fundamentals of Computer & Information Technology	4	80	20	3
BCA-103	Digital Electronics	4	80	20	3
BCA-104	Programming in C	4	80	20	3
BCA-105	PC Packages	4	80	20	3
BCA-106	Communicative English	4	80	20	3
BCA-107	Business Practices & Management	4	80	20	3
BCA-108	Practical-1 (C Language)	6	50	50	3
BCA-109	Practical-2 (PC-Packages)	6	50	50	3

Second Year

Paper No	Title	Periods Per Week (Theory/ Practical)	Max. Marks	Continual Internal Assessment	Exam Duration Hours
BCA-201	Mathematics-II	4	80	20	3
BCA-202	Computer Organization & Architecture	4	80	20	3
BCA-203	Object Oriented Programming with C++	4	80	20	3
BCA-204	System Analysis & Design	4	80	20	3
BCA-205	Operating System	4	80	20	3
BCA-206	Internet Technologies & Web Page Design	4	80	20	3
BCA-207	Accountancy	4	80	20	3
BCA-208	Practical -3 (C++)	6	50	50	3
BCA-209	Practical -4 (Internet & web page design)	6	50	50	3

Third Year

Paper No	Title	Periods Per Week (Theory/ Practical)	Max. Marks	Continual Internal Assessment	Exam Duration Hours
BCA-301	Mathematics-III	4	80	20	3
BCA-302	Programming in Visual Basic	4	80	20	3
BCA-303	Data Base Management System	4	80	20	3
BCA-304	Fundamentals of Networking	4	80	20	3
BCA-305	Management Information System	4	80	20	3
BCA-306	Numerical Methods	4	80	20	3
BCA-307	Personnel Management	4	80	20	3
BCA-308	Practical -5 (MS-Access)	6	50	50	3
BCA-309	Practical -6 (VB)	6	50	50	3
BCA-310	Project	--	200	--	3

In 3rd year the student has to develop one Software Project, which will be evaluated on the following basis:

  i) Project Report   50   marks
  ii) Viva-Voce   100   marks
  iii) Seminar   50   marks

Total 200   marks

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-I

Lectures 4 per week

UNIT-I

Set theory, quadratic equations, sequence & series, binomial theorems, exponential and logarithms series, determinants, matrices, vector algebra.

UNIT-II

Rectangular co-ordinates, length of a line segment, section ratio, area of a triangle, equations of a straight line circles, conic section, parabola, ellipse and hyperbola.

UNIT-III

Trigonometric functions, trigonometrical ratios of negative and associated angles, trigonometrical ratios of compound angles, multiple and sub multiple angles. Conditional identities involving the angles of a triangle, General solutions of trigonometrical equations. Trigonometrical identities, Properties of triangles, Heights and distances.

UNIT-IV

Functions, limits and continuity, Derivative of functions, Maxima & Minima, Infinite integrals and definite integrals, Solution of ordinary differential equation of Ist order and Ist degree.

Text & Reference Books:

1.   L.R. Dhanda, G.K. Saini and Suranjan Saha, "Systematic Modern Mathematics- Part-I & Part-II", Kalyani Publishers.

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al of Computers & Information

Lectures 4 per week

UNIT-I

Introduction- Characteristics of Computers, Evolution of computers, Capabilities and limitations of computers, Generations of computers, Types of computers(micro, mini, main frame, supercomputers), Block diagram of computer, Basic components of a computer system- Input unit, output unit, Arithmetic logic Unit, Control unit, central processing unit, Instruction set, registers, processor speed, type of processors, Memory- main memory organization, main memory capacity, RAM, ROM, EPROM, PROM, cache memory, PCs specifications.

UNIT-II

Input devices- Keyboard, Pointing Devices-mouse, Touch Screens, Joystick, Electronic pen, Trackball, Scanning Devices-Optical Scanners, OCR, OMR, Bar Code Readers, MICR, Digitizer, Electronic card reader, Image Capturing Devices-Digital Cameras.
Output devices- Monitors- CRT, LCD/TFT, Printers- Dot matrix, Inkjet, Laser, Plotters- Drum, Flatbed, Screen image projector.
Secondary Storage Devices- Magnetic Tape, Magnetic Disks-Internal Hard Disk, External Hard Drives, Floppy Disks, Optical Disks-CD, VCD, CD-R, CD-RW, DVD, Solid State Storage-Flash Memory, USB Drives.

UNIT-III

Computer Software- Software and its Need, Types of software-System software, Application software, System software-operating system, utility program, programming languages, assemblers, compilers and interpreter, introduction to operation system for PCs-DOS, windows, linux, file allocation table (FAT & FAT32), files & directory structure and its naming rules, programming languages-machine, assembly, high level, 4GL, their merits and demerits, application software and its types – word-processing, spreadsheet, presentation graphics, Data Base Management Software, Characteristics, Uses and examples and area of application of each of them, Virus working, feature, types of viruses, virus detection prevention and cure.

UNIT-IV

Data communication and computer network- Basic elements of a communication system, data transmission modes, data transmission speed, data transmission media-twisted pair coaxial, fiber optic,

munication satellites, Types of network lines, ISDN, DSL, broad band, Types of Internet, VPN, Topologies of LAN-ring, bus, star, mesh and tree topologies.

Text & Reference books:

1. Pradeep K. Sinha, Priti Sinha, "Computer Fundamentals". BPB Publications.
2. Rajaraman, V., "Fundamental of Computers". Prentice Hall India, New Delhi.

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ronics

Lectures 4 per week

UNIT-I

Fundamentals of semiconductor physics- Energy bands in solids- pn-junction diode depletion region, forward and reverse bias, diode as switch; Bipolar Junction Transistor, transistor configurations, bipolar junction transistor (CE configuration) as switch, Saturated and non-saturated logic, Integrated Circuits, characteristics of digital logic families-TTL, ECL, CMOS.

UNIT-II

Logic gates, AND, OR, NOT Gates and their Truth Tables, NOR, NAND & XOR gates, Boolean algebra, Basic Boolean Law's, Demorgan's theorem, Boolean function and their truth tables, MAP simplification, Minimization techniques, K-Map, Sum of Product & Product of Sum, Venn diagram.

UNIT-III

Combinational & Sequential circuits, Half adder & Full adder, BCD adder, Full Subtractor, Flip-flops-RS, D, JK, T & Master-Slave flip-flops, Shift registers, Multiplexer, Encoder, Decoder.

UNIT-IV

A/D and D/A converters: D/A conversions – Weighted-Register D/A converter, R-2R ladder D/A converter, A/D conversions-Counter type method using D/A, dual slope integrator method, successive approximation method, simultaneous method.

Text & Reference Books:

1. Rajaraman V. & Radhakrishnan, "An Introduction To Digital Computer Design", PHI.
2. Malvino & Leach, "Digital Principles & Applications", TMH Publications.
3. Jain R.P. , "Modren Digital Electronics". TMH Publications.
4. Malvino, "Digital Computer Electronics". TMH Publications.
5. Bartee T.C., "Digital Computer Fundamentals". THM Publications.

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to Programming in C
Lectures 4 per week

UNIT-I

Introductory Concepts- Introduction to computers, Computer characteristics, modes of operation, Types of programming languages, Introduction to C, some simple C programs, Desirable program characteristics.

C Fundamentals- C character Set, Identifiers and keywords, data types, constants, variables and arrays, Declarations, expressions, statements, Symbolic constants.

UNIT –II

Operators and expressions- Arithmetic operators, unary operator, Relational and logical operators, assignment operators, conditional operators, Library Functions.

Data Input and Output- Preliminaries, singe character input, singe character output, Entering input data, writing output data, the gets and puts function.

Preparing and Running a Complete C Program- Planning a program, Writing a C program, entering the program into the compiler, compiling and executing the program, error diagnosis, debugging techniques.

UNIT-III

Control Statements- Preliminaries, Branching, Looping, Nested control statements, switch statement, break statement, The continue statement, The goto statement, The comma operator.

Arrays: Defining an array, processing an array, passing arrays to functions, Multidimensional arrays, Arrays and strings.

Functions: A brief overview, Defining a function, accessing a function, function prototypes, passing arguments to a function, recursion.

UNIT-IV

Pointers- Fundamentals, Pointer declarations, Passing pointers to the functions, pointers and one dimensional array, dynamic memory allocation, Operations on pointers, arrays of pointers.

Data files- Opening and closing a data file, creating a data file, processing a data file, unformatted data files.

Text & Reference Books:

1. Byron Gottfried, "Programming with C", Schaum's Outlines, Tata McGraw Hill.
2. Mullis Cooper, "Spirit of C": Jacob Publications.

'Let us C": BPB.

Ritchie D. M., "The C Programming

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Lectures 4 per week

DOS commands (internal (DIR, DATE, TIME, CLS, CD, RD, MD, PATH, TYPE, DEL, ECHO, COPY, REN, PROMPT, VOL, VER), external (ATTRIB, CHKDSK, DISKCOPY, DISKCOMP, XCOPY, TREE, DELTREE, DOSKEY, FORMAT, FIND, SORT, FDISK, MORE, SYS)), Concept of files & directories, Wild card characters, Redirection operators.
Windows XP, Definition, Benefits, Features & uses of Windows XP, Control panel, Accessories, Task bar, My computer uses, Recycle bin.

UNIT -II

Common Office 2003 Elements, Introduction to Office 2003, Customizing the Office Environment, Managing Files in Office, Text Tools, Drawing and Graphics Tools.
Word Processing, Definition, Benefits, Features & uses of Word 2003, Menus, Toolbars, Cursor control keys, Short cut keys, Hot keys, Editing Text, Document Formatting, Reusable formatting with Styles and Templates, File handling (opening, creating, saving, printing, editing), Formatting text, Find and replace, Tables and Columns, Advanced Page Layout in Word, Automating Information with Fields, Managing Long Documents, Spell check, Thesaurus, File protection, Mail Merge, Labels, and Envelopes, Macros.

UNIT –III

Spreadsheets, Definition, Benefits, Features & Uses of MS Excel 2003, Menus, Toolbars, Worksheets, Formatting Worksheets and Restricting Data, Calculating with Formulas and Functions, Ranges, Auto fill, Data (sort, filter, validation, subtotal), Viewing and Manipulating Data with charts and PivotTables, Print, Goal seek, Scenario, Macros, Creating Excel Databases.

UNIT –IV

Presentations, Definition, Benefits, Features & Uses of PowerPoint, Menus, Toolbars, Creating and Editing Slides, Adding graphics, Multimedia, and Special Effects to Slides, Insert (picture, slide, text), Master slide, Views, Animation, Action buttons, Macros.

Text & Reference Books:

1. Jennifer Ackerman Kettell, Guy Hart-Davis, Curt Simmons, "Microsoft Office 2003: The Complete Reference", Tata McGraw Hill.
2. Biswaroop Roy Choudhary, "Computer course", Fusion Books.

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ive English

Lectures per week 4

UNIT –I

Grammar and Reading Skills- Skills of effective reading, reader related material, memory and retention, Parts of speech, writing correctly transformation of sentences, incorrect to correct English, tenses and replacing single word for group of words.

UNIT –II

Skills in Writing- letters, official/business correspondence. CV's, Tech. Reports/types, Precis, comprehension, Paragraph writing (200 word) on current topics, writing notices, agenda, circulars.

UNIT –III

Secretarial Skills- Effective communication, listening and feedback skills, telephone handling, Attending meeting, preparing of agenda, writing of minutes, summaries. Handling problem situations. Control of voice and proper use of phonetics.

UNIT –IV

Presentation and Discussion Skills- Types of communication. Barriers to Communication. Effective use of kinesics, Planning interviews and making presentations. Taking initiatives- especially in group discussions, overcoming nervousness, making audience analyses and establishing leadership.

Text & Reference Books:

1. K.K. Sinha, "Business Communication".
2. Varinder Pal, "Business Communication".
3. T. M. Farhatullah, "Communication Skills for Technical Students".
4. Shiv K. Khera, "You can Win".

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Practice and Management
Lectures per week 4

Concepts of Business, Commerce and Industry, Business Environment- Macro and Micro Environment, Business System, Forms of Business Organization - Sole trader, Partnership, Companies HUF and Co-operative organization.

UNIT-II

Organization structure-Meaning and importance, Nature and Types of Organization, Forms of Organization, Formal and Informal Organization, Line and staff Agency, Theories of Organization- Human Relations theory, Bureaucratic theory, System theory and Contingency theory of organization.

UNIT-III

Management- Meaning, definition and importance, Management concept, functions, Principles of management and Management Process. Planning- concepts and its types, Decision making concept, Management by objectives (M.B.O.). Motivation-Concepts and theories, Leadership- Concepts and styles.

UNIT-IV

Organizing- Concepts, Nature and Significance, Authority and responsibility, Centralization and Decentralization, Communication-Nature, Process and types of communication networks. Managerial control - concepts and Process, Techniques of control.

Text & Reference Books:
1. Sharma Sudhir and Bansal, "Principles of Management", Anamika Publishers.
2. Sharma, R. K. and Gupta, S. K., "Business Organisation and Management", Kalyani Publishers.
3. Sharma, N. K., "Current issues in Management", Indus Valley Publication.
4. Singh, U.K. and Dewan J.M., "Business Management", Management Executives Handbook Series.
5. Michael A. Hitt, Black, J. Stewart, "Management", Pearson Education.
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-II

Lectures 4 per week

Rolle's Theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem; their geometrical significance and applications. Successive differentiation and Leibnitz Theorem. Taylor's Theorem.

UNIT-II

Infinite limits and indeterminate forms. Hyperbolic and inverse hyperbolic functions; their differentiation and integration. Partial differentiation of functions of several variables; their limit, continuity and differentiability. Homogenous functions and Euler Thorem.

UNIT-III

Reduction formulae for integrals involving

(i) $x^n e^x$ (ii) $x^m (\log x)^m$ (iii) $x^n \cos x$ and $x^n \sin x$ (iv) $\cos^n x \sin^m x$

UNIT-IV

Scalar and Vector functions; limit, continuity and differentiability of a vector function. Directional derivative, gradient of a scalar field, divergence and curl of a vector field. Line, surface and volume integrals, Theorem of Gauss, Stoke's and Green's (proofs not needed) and their applications.

Text & Reference Books:

1. J.C. Burkill, "A First Course in Mathematical Analysis", Vikas Publishing House.
2. S.K. Chatterjee, "Mathematical Analysis (Real)", Oxford IBH Publishing Co.
3. Shanti Narayan, "Differential Calculus", S. Chand and Co.
4. Shanti Narayan, "Integral Calculus", S. Chand and Co.
5. E. Kreyszig, "Advanced Engineering Mathematics", Wiley Eastern Pvt.Ltd.

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Data representation, number systems, decimal to binary, octal and hexadecimal conversion and vice versa, binary coded decimal numbers, hamming code for error detection, alphanumeric codes, arithmetic operations, binary addition and subtraction, addition/subtraction of numbers in 1's and 2's complement notation for binary numbers and 9's and 10's complement notation for decimal numbers, binary multiplication and division, BCD arithmetic, floating point addition and subtraction.

Unit 2

Register Transfer Language- Register transfer, Bus and Memory transfer (three-stage bus buffers, memory transfer), arithmetic micro-operations (Binary Adder, Binary-adder-Substractor, binary incrementer, arithmetic circuit), Logic micro-operation (list op logic micro-operations, hardware implementation), shift micro-operations (hardware implementation), arithmetic logic shift unit, instruction codes (stored program organization, indirect address), computer registers (common bus register), computer instructions (instruction set completeness), timing and control, instruction cycle (fetch and decode, types of instruction, register-reference instructions), Micro programmed control, control memory, addressing sequencing (conditional branching, mapping of instructions, subroutine)

Unit 3

Central Processing Unit- Introduction, general register organization (control word, examples of micro-operations), stack organization (register stack, memory stack, reverse polish notation, evaluation of arithmetic expressions), instruction formats (three-address instructions, two address instructions, one-address instructions), addressing modes, data transfer and manipulation (data transfer instructions, data manipulation instructions, arithmetic instructions, logical and bit manipulation instructions, shift instructions), Program control (status bit conditions, conditional branch instructions, program interrupt, types of interrupt).

Unit 4

Input Output Organization- Introduction to peripheral devices, input output interface (I/O bus and interface modules, I/O versus memory bus, isolated versus memory-mapped I/O), asynchronous data transfer (strobe control, handshaking), modes of transfer (programmed I/O, interrupt- initiated I/O, software considerations), priority interrupt (daisy-chaining priority, parallel priority, priority encoder,

...mory access (DMA controller, DMA transfer), ... memory (RAM and ROM chips, memory ... connection to CPU), Auxiliary memory (Magnetic disk, magnetic tape).

Text and reference books:

1. M.Morris Mano, "Computer System Architecture" 3rd edition, PHI.
2. V. Rajaraman, T. Radhakrishanan, "An Introduction to Digital Design", PHI
3. J.P.Hays, "Computer Organization and Architecture", McGraw Hill.

...ted Programming with C++

Lectures 4 per week

UNIT-I

Object oriented programming- Need for OOP, object oriented approach, characteristics of OOP language- objects, classes, Inheritance, Reusability, Polymorphism, overloading advantage of OOP, relationship between C and C++.

Programming Basic- Basic program construction, output using cout, preprocessor directive, comments, integer variables, character variables, input with cin, Type bool, setw Manipulator, type float, type conversion, arithmetic operators, relational operators, logical operators.

UNIT-II

Loops and decision control statements- loop- for, while, do, decision- if, if- else, switch, conditional operator, other control statements- break, continue, goto.

Structures and functions- structures, Accessing structure members, structure within a structure, Enumerated Data type, simple functions, passing arguments to functions, Returning values from functions, reference arguments, overloaded functions, storage classes, scope resolution operator.

UNIT-III

Objects and classes- A simple class, classes and objects, specifying a class, using a class, C++ objects as physical objects, C++ objects as data types, Constructors, objects as function arguments, returning objects from functions.

Arrays- Array fundamental-defining array, array elements, Accessing array elements, Initializing arrays, multidimensional arrays, passing arrays to functions, array of objects, strings-string variables, Avoiding Buffer overflow, string constants, array of strings string as class members, Standard C++ string Class.

UNIT-IV

Operator overloading- Overloading unary operators- the operator keyword, operator arguments, operator return values nameless temporary objects, limitation of increment operators, overloading Binary operators, data conversion, Pitfalls of operator overloading and conversion.

Inheritance- Derived class and base class, specifying the derived class, accessing base class, members, derived class constructors, overriding member functions, class hierarchies, public and private

itance, multiple inheritance, Ambiguity in
gation- Classes Within Classes.

Text & Reference Books:

1. Robert Lafore, "Object-Oriented Programming in C++", Galgotia Publications.
2. B. Chandra, "Object-Oriented Programming using C++", Narosa Publications.

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Analysis And Design

Lectures 4 per Week

UNIT -I

Overview of System Analysis and Design, Business System concepts, System development life cycle, Project Selection, Feasibility Analysis, Design, Limitation, testing and evaluation.
Initial Investigation- Sources of Requests, User / Analyst, interaction,

UNIT –II

Qualities of a System Analyst, Feasibility studies- Technical and economic feasibilities, cost and benefit analysis.

UNIT –III

System requirement specification and analysis- Fact finding techniques, Data Flow Diagrams, Data Dictionaries, process organization and interaction, Decision Analysis, Decision Trees and Tables. Top down and bottom up variance, Audit trails.

UNIT –IV

Detail Design- Modularization, module specification, file design, system development involving databases.
System control and quality assurance- Design objectives reliability and maintenance, software design and documentation tools, unit and integration testing, testing practice and plans, system control.

Text & Reference Books:

1. Awad, "System Analysis Design", Galgotia Publishing, Delhi.
2. Jamas, A.S., "Analysis and design of information systems", Mc Graw Hill.
3. Luteberg, M.,Golkuhl, G and Hilsson, A, "Information System Development a Systematic Approach", PHI.
4. Leeson N., "System Analysis and Design", Science Research Associates, 1985.
5. Samprive, P.C., "System analysis: Definition Process and Design".

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g System

Lectures 4 per Week

Operating System Concepts- Operating System Classification- Simple Monitor, Multi Programming, Time Sharing, Real Time Systems, Multiprocessor Systems, Batch Processing, Simple User, Multi User, Operating System Functions And Characteristics.

UNIT –II

Processor Management- Process Overview, Process States, Process State Transitions, Process Control Block, Operations On Processes, Suspend And Resume, Interrupt Processing, Scheduling Algorithms, Multiple Processor Scheduling.
Deadlock- Deadlock Problem, Deadlock, Deadlock Characterization, Necessary Conditions, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery From Deadlock.

UNIT –III

Memory Management- Partition, Paging, Segmentation, Types Of Memory Management Scheme , Bare Machine, Resident Monitor, Swapping, Multiple Partition, Virtual Memory, Demand Paging.

UNIT –IV

File Management- File Types, Operation On Files, File Support, Access Methods, Sequential Access, Direct Access, Index, Allocation Method (Free Space Management, Contiguous, Linked, Indexed), Directory System Single-Level, Two-Level, Tree-Structured, File Protection.

Text & Reference Books:

1. James L. Peterson And Abraham Silberschatz, "Operating System Concepts", Addison Wesley Publishing Company.
2. H.M.Deitel, "Operating Systems", Addison Wesley Publishing Company.
3. A.M.Lister, "Fundamentals Of Operating Systems", Macmillan Publishers Ltd.

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UNIT-I

Internet- Evolution of Internet, Internet Application, Network requirements, Bandwidth, Internet features (Electronic Mail, Newsgroups, FTP Archive, Real Time Activity, Video, Audio, Search Engine), World Wide Web, WWW Browsers, WWW Servers, Dial-Up SLIP, PPP Access, Dedicated line, ISDN.

UNIT–II

TCP/IP Connectivity- DNS Servers, Domain Names Registration process, IP addressing, Routing with TCP/IP Basics, Routing Protocol (Classification, Algorithms), Static Routing, Open Shortest Path First Protocol, Exterior Gateway Protocols (EGP, Border Gateway Protocol, Multi-Routing Protocol Environments).

UNIT-III

HTML - Text formatting, Data, Tables, Table layout, Images, HTML Interactivity, URLs, HTTP, NNTP, Hyperlinks, Menus & Image Maps, HTML Form, Embedded objects in HTML, Web Typography, Approaching Web Typography, Graphics and Type, Families and Faces, Type forms, Color and Type, Adding Graphics, Adding Graphics with the Image Element, Using images as links, Creating Image Maps, Working with Image Files, Layout Technology, Standard HTML Formatting, Tables, Frames,

UNIT-IV

Formatting your site with Cascading Style Sheets, Seeing Style Sheets in Action, Understanding CSSI's Advantages and Limitations, Making HTML and CSSI's, Making HTML and CSSI work together, Learning How CSSI Works, Using CSSI Properties. XML, XML Language, SMGL, Linking in XML.

Text & Reference Books:

1. Internet Get Started: BPB Publications.
2. Loren Buhle, "Webmaster Professional Reference", New Riders Publishing.
3. Rick Darnell "HTML 4", Techmedia.
4. Tauber, "Mastering Front Page 2000" BPB.
5. James Jaworski, "Making Java Script and JSCRIPT", BPB Publications.
6. HTML Complete: BPB Publisher.

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...ancy

Lectures per week 4

UNIT-I

Meaning, Definition and objects of Accounting, Accounting Principles, Book keeping and Accountancy. Accounting concepts and Conventions, Principle of Double Entry System, Journal Entry, Ledger, Cash Book and Subsidiary books, Trial Balance and rectification of errors.

UNIT-II

Final Account- Manufacturing Account, Trading Account, Profit and Loss Account and Balance Sheet. Company Accounts- Issue and Forfeiture of Shares and Debentures, Redemption of Shares and Debentures.

UNIT-III

Cost Accounting - Nature and scope of Cost Accounting, Cost Concept and classification, Cost Sheet, Budget and Budgetary Control, Marginal Costing (BEP and Cost Volume Profit analysis).

UNIT-IV

Management Accounting - Meaning, importance and Scope of Management Accounting, Financial Statement Analysis, Brief introduction to the tools of Analysis (Ratio, Fund Flow and Cash Flow Analysis).

Text & Reference Books:

1. Maheswari, S. N., "Fundamental Accounting", Vikas Publishing House.
2. Anthony, R.H. and Roece, J. S., "Accounting Principles", Homewood Illinois.
3. Hongren, Charles J. and Faster, "Cost Accounting: A managerial Emphasis", Prentice Hall International.
4. Gupta, R. L., "Advanced Financial Accounting", Sultan Chand and Company.
5. Pandey, I. M., "Management Accounting", Vikas Publishing House.
6. A.T. Kinson, "Management Accounting", Pearson Education.

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-III

Lectures per week 4

UNIT-I

Order, degree, solution and formation of a differential equation. Standard techniques of solving linear differential equations with constant coefficients, Cauchy's and Legendres, Linear differential equations with variables coefficients.

UNIT-II

Complex numbers and their representation in a plane. Argand diagram, algebra of complex numbers, modulus and arguments of a complex number, square root of a complex number and cube roots of unity, triangle inequality, De-Moivre's theorem, roots of complex numbers.

UNIT-III

Sequences- Convergence or divergence of a sequence. Infinite series- its convergence and sum, series with positive terms and standard tests of convergence- p-series tests, comparison tests, D' Alemberts ratio test, Raabes test, Cauchy's root test, Integral test (Without proofs); Alternating series , Leibnitz test, Absolute convergence.

UNIT-IV

Discrete mathematics- Logic, connectives, statement formulas and truth tables. Relations, Binary Relations, Equivalence Relation, Partitions Equivalence classes Partial ordering, Relations to sets, Maximal and Minimal Element, Upper and Lower Bounds.

Text & Reference Books:

1. Shepley L. Ross, "Differential Equations", John Wilay & Sons.
2. E. Krayszig, "Advanced Engineering Mathematics", Wiley Eastern Pvt. Ltd.
3. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publisher.
4. J.P. Tremblay and R. Manohar, "Discrete Mathematical structures with applications to Computer Science", Tata McGraw Hill.

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g in Visual Basic

Lectures per week 4

UNIT –I

An introduction to Visual Studio- An introduction to .NET development-Windows Forms and Web Forms applications, Visual Studio and the .NET programming languages, .NET Framework, Visual Studio IDE, Visual Basic application compile and run, Visual Basic differs from the other .NET languages

A tour of the Visual Studio IDE-Start Visual Studio, Open or close an existing project, possible menu variations, use the Form Designer, use the Code Editor, use the Solution Explorer, work with Visual Studio's windows

Test a project- Build a project, run a project, upgrade projects and change .NET Framework versions, upgrade projects created in earlier versions of Visual Basic .NET, change the .NET Framework version used by a project, design a Windows Forms application, set options and create a new project, set the Visual Studio options, change the import and export settings, create a new project

Design a form-Add controls to a form, Set properties, common properties for forms and controls, add navigation features, property settings, use Document Outline view, name and save the files of a project, code and test a Windows Forms application

An introduction to coding-Introduction to object-oriented programming, refer to properties, methods, and events, application response to events, Add code to a form, create an event handler for the default event of a form or control, IntelliSense helps you enter the code for a form, code with a readable style, code comments, detect and correct syntax errors.

use the toolbar buttons, collapse or expand code, print the source code, code snippets, use the Smart Compile Auto Correction feature, use the My feature, get help information, run, test, and debug a project

UNIT –II

Work with numeric and string data-Work with the built-in value types- Declare and initialize variables, declare and initialize constants, code arithmetic expressions, code assignment statements, work with the order of precedence, use casting, change the type semantics, use the Math class, work with strings, declare and initialize a string, join and append strings.

Convert data types- .NET structures and classes that define data types, use Visual Basic functions to convert data types, use methods to convert data types, use three of the formatting functions, use methods to convert numbers to formatted strings, three skills for working with data (work with scope, declare and use enumerations, work with nullable types). The basic application,

...ode Boolean expressions, Use the relational ...operators, Code conditional statements, ...lect Case statements, Code loops, Code For loops, code Do loops, use Exit and Continue statements, Debugging techniques for programs with loops.

Future Value application- The design and property settings for the form, code for the form

UNIT –III

Code procedures and event handlers- Code and call procedures- Code Sub procedures, call Sub procedures, When and how to pass arguments by reference and by value, code and call Function procedures, work with events, start an event handler for any event, handle multiple events with one event handler, use the Code Editor to start an event handler, add and remove event wiring.

The Function procedure, event handlers

Handle exceptions and validate data- An introduction to data validation and exception handling, use the IsNumeric function for data validation, display a dialog box for error messages, exception handling works, Use structured exception handling, catch an exception, use the properties and methods of an exception, catch specific types of exceptions, throw an exception, application with exception handling.

Validate data- Validate a single entry, use generic procedures to validate an entry, validate multiple entries, application with data validation, dialog boxes, code, two ways to validate data (use the Validating event, use the masked text box).

UNIT -IV

Work with arrays and collections- Work with one-dimensional arrays, create an array, assign values to the elements of an array, use For loops to work with arrays, use For Each loops to work with arrays, work with rectangular arrays, create a rectangular array, assign values to a rectangular array, work with rectangular arrays, work with jagged arrays, create a jagged array, assign values to a jagged array, work with jagged arrays, use the Array class, refer to and copy arrays, code procedures that work with arrays, work with collections, commonly used collection classes, typed vs. untyped collections.

Work with a list, work with a sorted list, work with queues and stacks, work with an array list.

Work with dates and strings- Work with dates and times, create a DateTime value, get the current date and time, format DateTime values, get information about dates and times, perform operations on dates and times, use Visual Basic properties and functions to work with dates and times, work with strings, properties and methods of the String class, Code examples that work with strings, procedures for validating user entries, use the StringBuilder class, use the Visual

with strings, Format numbers, dates, and mat dates and times

ms and controls-Work with controls, types of controls, work with combo boxes and list boxes, work with check boxes and radio buttons, work with group boxes, use Tab Order view to set the tab order, get the information you need for using a control

Work with multi-form projects- Add a form to a project, rename a form, change the startup form for a project, display a form as a dialog box, pass data between a form and a custom dialog box

Use the MessageBox class- Display a dialog box and get the user response, use the FormClosing event

Debug an application- Basic debugging techniques, set the debugging options, work in break mode, use the Edit and Continue feature, use breakpoints, control the execution of an application, use the debugging windows, use the Locals window to monitor variables, use the Autos window to monitor variables, use Watch windows to monitor expressions, use the Immediate window to execute commands, use the Call Stack window to monitor called procedures, use the Output or Immediate window to get build or debugging information, use Visualizer dialog boxes to view strings.

Text & Reference Books:

1. Anne Boehm, Mike Murach and Associates "Murach's Visual Basic 2008", Publisher of Professional Programming.
2. Steven Holzner Visual Basic 6 programming, Black Book.

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ement Systems

Lectures 4 per week

UNIT-I

Introduction To Database Concepts- Data Modeling for a Database, Fields, Records and Files, Abstraction and Data Integration, Database Architecture, Users, Structure of DBMS, Advantages and Disadvantages of DBMS.

Data Models- Entity, Attribute, Relationship, Data Model Classifications, File based, Traditional, Semantic, Entity-Relationship Model.

UNIT-II

File Organization- Operation on files, Sequential Files, Index-Sequential Files, Types of Indexes, Implicit, limit, multilevel, Direct Files, Indexing using B-Tree Structure.

Relational Model- Relational Database- Relational Algebra, Relational Calculus.

UNIT-III

Relational Database Design- Relational Scheme and Relational Design, Functional Dependency, Normal forms (First, Second, Third, Boyce Code), Decomposition and dependency preservation, Multi-valued dependency.

UNIT-IV

Ms Access- Tables (Creation/Design structure, Data Entry), Primary keys, Foreign Keys Master-Detail Table, Query (Select, Make-Table, Update, Append, Delete) Form (Modal, Modeless), Relationships Report (Creation of a simple report from a table and from a query).

Text & Reference Books:
1. Elmasri And Navathe, "Fundamentals of Database Systems", Benjamin/Cummings Publishing Co. Inc.
2. Bipin C. Desai, "An Introduction to Database Management System".
3. Users Reference Manuals Of Ms Access.
4. Date, C.J., "An Introduction to Database system", Narosa Publishing House.

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...ls of Networking

Lectures 4 per week

Unit-I

Introduction to Communication Network- Computer Networks, (Need, uses, and Advantages of Computer Network), Network Models (Peer-to-Peer-Network, Server-based Network, Client-Server Network), Network components, Network Topology (Star, Ring, Bus, Mesh, Tree, Hybrid, Advantage and Disadvantage of each types.), Types of Networks (LAN, MAN, WAN), Internet (Brief History, Internet Today, Protocol and Standard), Data Communication, Component, Data Representation, Analog Signals, Digital Signals, Transmission Modes (Asynchronous and Synchronous) Transmission Networks (Serial and Parallel), Communication modes (Simplex, Half Duplex, Full duplex) Signal Transmission (Base band and Broadband), Digital Signal encoding.

Unit-II

Error Detection and Correction Types of errors (Single–bit-error, Burst-Error), Error Detection (Redundancy, Parity check, CRC, Checksum), Error correction (FEC, Hamming code, Burst error corrections) Data Communication Channel and Media, Conductive Media (Twisted-pair cable, Coaxial cable), Fiber optics (Characteristic of light, Types of Fiber optics), Wireless Transmission, (Microwaves, Infrared, Radio waves), Transmission Impairment (Attenuation, Bandwidth Latency, Throughput and Channel capacity.) Multiplexer and Switching Concepts Types of multiplexer (TDM, FDM, SPM, FPM, CDM, WDM), Switching concept (Circuit Switching Message Switching, Packet Switching and Cell switching)

Unit-III

OSI-Reference Model, OSI Model, OSI Physical Layer Concepts, DLL, Network Layer, TL, SL, PL and AL Concepts. Internet model / TCP/IP Model and Protocols, Modem, DSL, Cable Modem, ISDN, Real world network (Ethernet, Ethernet operation, frame format, Ethernet characteristic, cabling and components) Token Ring and Token Bus networking Technology, Fast Ethernet networking technology (fast Ethernet Media types, Repeaters, Networking diameter), Gigabit Ethernet Technology (Standards, characteristics, Protocol Architecture), Network Connectivity, Repeater, Hub-(Active, Passive and Intelligent), Bridge-(Local, Remote and wireless), Routers (Static and Dynamic), switches and types of switches, Brouter and Gateways, Backbone Network and Virtual LAN.

Unit-IV

TCP/IP Protocol Suite, Internet Architecture Board, TCP/IP Protocol (TCP,UDP,IP,ARD), concept of Physical Addressing, and logical

es of IP addressing, Special IP Addressing, etting, Super netting, Classless addressing, (FTP,SMTP, TELNET, DNS, IPV6, HTTP, WWW), Wireless LAN (Component, Topologies, Technology, Standard, Security) Network Security, Security issues, Element of N/W Security, common Threats, attacks, Firewall (needs, feature of firewall.)

Text & Reference Books:

1. Ata Elahi, Mehran Elahi, "Data, Network and Internal communication Technology", Cengage .
2. Behrowz A. Forouzan , "Data Communication and Networking".
3. Andrew S. Tahanbaum, "Computer Network".

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Information System

Lecture 4 per week

Meaning and Role of Management Information System- Introduction, Definition, System's Approach.
Development of Organizational Theory, Management & Organizational Behaviour, Management, Information & System Approach.

UNIT –II

Data Processing- Operation of Manual Information System, Components of Computer System, Conversion of Manual to Computer Based Systems, Data Bank Concept, Types of Computer Based Applications.
Information System for Decision Making- Evolution of Information System, Decision Making & Management Information System.

UNIT –II

Strategic & Project Planning for Management Information System- Business Planning, Management Information System Responses, Management Information System Planning- General & Details.
Conceptual System Design- Define Problem, Set System Objective, Establish System Constraints, Determine Information Needs & Sources, Develop Alternative Conceptual Design & Documentation, Prepare the Design Report.

UNIT –IV

Detailed System Design- Aim, Project Management, Define Subsystem, Input, Output & Process Design, System Testing, Software & Hardware selection, Documentation of Detailed Design.
Pitfalls in Management Information Systems.

Text & Reference Books:

1. Robert G. Murdick, Joel E. Ross, James R. Claggett, "Information System for Modern Management".
2. Surendra Basandra, "Computers Today".

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...lethods   **Lectures 4 per week**

UNIT-I

Representation of numbers, Decimal to Binary conversion, Floating point representation of numbers, Integer and real/floating point arithmetic, different types of errors, error in the approximation of a function, error in series approximation, Solution of algebraic and transcendental equation using Bisection method, Regula-Falsi method, Newton-Raphson method.

UNIT-II

Solution of simultaneous linear equations using Gauss Elimination method, Gauss-Jordon method, Jacobi's iterative method, Gauss-Seidel iterative method. Interpolation, Finite difference and operators, Newton Forward, Newton Backward, Games forward, Games backward, Stirling's Interpolation divided difference formula.

UNIT-III

Numerical differentiation- Differentiating a Graphical function, Differentiating a Tabulated function- Equal and Un-equal intervals, Numerical integration, Newton-Cotes formula, Trapezoidal rule, Simpson's -1/3rd and 3/8th rule, Weddle's rule.

UNIT-IV

Solution of ordinary differential equation using Picard's method, Taylor's series method, Euler's method, Modified Euler's method, Runge-Kutta method, Predictor-Corrector method.

Text & Reference Books:

1. B.S. Grewal, "Numerical methods in Engg & Science".
2. R.S. Salaria, "Computer Oriented Numerical Methods" Khanna Book Publishing Co., New-Delhi.
3. V. Rajaraman, "Computer Oriented Numerical Methods", PHI.
4. S.S. Sastry, "Numerical method".

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Management

Lectures 4 per week

UNIT-I

Introduction to Personnel Management -Nature, Scope, functions and significance, Personnel Policies, classification and organization of Personnel Department, Various structures and types of Personnel Department.

UNIT-II

Human Resource Planning- Meaning, objectives and importance, requisites for successful HRM, Job Analysis and Design, Recruitment, selection, Terms of Employment, Induction and Briefing, Orientation and Placement.

UNIT-III

Human resources Development- Training and Development and Promotion and incentives, retirement benefits, Performance Appraisal and Job Evaluation, Employee remuneration and various incentive plans.

UNIT-IV

Industrial Relations- Concept and Significance, Trade Unions, Dispute settlement, Ethical issues in Personnel Management, Employee welfare, Meaning and Types of welfare activities, Employee safety and management of employee's Health.

Text & Reference Books:
1. Ashwathappa, K, "Human Resource and Personnel Management", Tata McGraw Hill.
2. De Cenzo, D. A. Robbins. S, "Personnel and Human Resource Management", Prentice Hall of India.
3. Mamoria, C.B., "Personnel Management", Himalaya Publishing House.
4. Deardwell, Ian, "Human Resource Management", Prentice Hall India.
5. Grobler, P. A., "Human Resource Management", Anamika Publishers.

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