

Vikram University, Ujjain

Board of studies in Computer science

SYLLABUS of B.C.A (Hon’s) Programme

[Choice Based Credit System & Grading System (CBCS & GS)]

Exclusively for University Teaching Department (ICS, VUU)

THREE YEARS B.C.A (Hon’s) (FULL TIME) PROGRAMME of UTD (ICS, VUU)

(Effective from Academic Session 2020-21)

[Modified as according to the provision of “Ordinance No. 69 for Programme and Ordinance No. 14 for CBCS Pattern”]

COURSE STRUCTURE

BCA (Hon’s) - FIRST SEMESTER

S N	Course Type	Course code	Title	End term sem Exam	Inter nal	Max Marks	Credits*	Distribution of Credits		
								C	L	T
1	Core Course	BCAH-101	Programing in C	60	40	100	<u>6</u>	<u>4</u>		<u>2</u>
		BCAH-102	Mathematics-I	60	40	100	<u>6</u>	<u>4</u>	<u>2</u>	
2	Course for Ability Enhancem ent & skill Developme nt (AE & SD)	BCAH-103	Financial Accounting	60	40	100	<u>6</u>	<u>4</u>	<u>2</u>	
Choose any one From BCAH-104E1 and 104E2										
3	Elective Discipline Centric	BCAH- 104E1	Introduction to Information Technology	60	40	100	<u>6</u>	<u>4</u>	<u>2</u>	
		BCAH- 104E2	Internet and its Applications	60	40	100	<u>6</u>	<u>4</u>	<u>2</u>	
Choose any one From BCAH-105E1 and 105E2										
4	Elective Generic Categories	BCAH- 105E1	Digital Electronics	60	40	100	<u>6</u>	<u>4</u>	<u>2</u>	
		BCAH- 105E2	Any Course from Massive Open Online Courses (MOOCs)available at SWAYAM	60	40	100	<u>6</u>	<u>4</u>	<u>2</u>	
5		BCAH-106	Practical (Based on BCAH- 101)	<u>50</u>	-	50	<u>04</u> <u>Virtual</u> <u>(VR)</u>			
			Total			550	<u>30+4</u>	<u>20</u>	<u>08</u>	<u>02</u>

(C=Credit Per Week) / (L = Lectures Per Week)/ (T & PW =Tutorials & Practical Work per week)

*One Credit is equivalent to one hour (60 minutes) of teaching (lecture or tutorial) and two hours (120 minutes) for practical

Note: (1) The students will have the choice to opt a course under the category of Elective Courses available within the UTD (ICS, VUU) or in other UTDs but from same level of the programmes. (2)An alternative choice will also be available to the students to opt a course in each semester under elective-generic category including skill development course from Massive Open Online Courses (MOOCs) available at SWAYAM plate form. (3) The student can also opt a course under Elective- Discipline Centric category from Massive open online courses (MOOCs) available at SWAYAM plate form. In such cases, the provisions “Ordinance 14 : Choice Based Credit System” shall be applicable and the conditions mentioned therein will need to be satisfied by the student if they opt courses from Massive Open Online Courses (MOOCs) available at SWAYAM plate form.

Vikram University, Ujjain –B.C.A (Hon’s) Syllabus
(As per CBCS pattern)w.e.f. 2020-21 and onwards

BCA (Hon’s) - SECOND SEMESTER

S N	Course Type	Course code	Title	End term sem Exam	Inter- nal	Max Marks	Credits*	Distribution of Credits		
								C	L	T
			Core Courses				C	L	T	P
1	Core Course	BCAH-201	Object Oriented Programming Using C++	60	40	100	6	4		2
		BCAH-202	Mathematics-II	60	40	100	6	4	2	
2	Course for Ability Enhancem ent & skill Developme nt (AE & SD)	BCAH-203	Office Automation and PC Software	60	40	100	6	4		2
Choose any one From BCAH-204E1 and 204E2										
3	Elective Discipline Centric	BCAH- 204E1	Database Management System	60	40	100	6	4		2
		BCAH- 204E2	Internet Programming	60	40	100	6	4		2
Choose any one From BCAH-205E1 and 205E2										
4	Elective Generic Categories	BCAH- 205E1	Operating Systems	60	40	100	6	4	2	
		BCAH- 205E2	Any Course from Massive Open Online Courses (MOOCs)availabl e at SWAYAM	60	40	100	6	4	2	
5		BCAH-206	Practical (Based on BCAH- 201)	50	-	50	04 Virtual (VR)	20	04	06
			Total			550	30+04			

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BCA (Hon’s) - THIRD SEMESTER

S N	Course Type	Course code	Title	End term sem Exam	Internal	Max Marks	Credits*	Distribution of Credits		
								C	L	T
1	Core Course	BCAH-301	Data Structure using C++	60	40	100	6	4		2
		BCAH-302	Programming with VB.NET	60	40	100	6	4		2
2	Course for Ability Enhancement & skill Development (AE & SD)	BCAH-303	Communication Skills	60	40	100	6	4	2	
Choose any one From BCAH-304E1 and 304E2										
3	Elective Discipline Centric	BCAH-304E1	System Analysis and Design	60	40	100	6	4	2	
		BCAH-304E2	Management Information System	60	40	100	6	4	2	
Choose any one From BCAH-305E1 and 305E2										
4	Elective Generic Categories	BCAH-305E1	Data Communication and Computer Network	60	40	100	6	4	2	
		BCAH-305E2	Any Course from Massive Open Online Courses (MOOCs)available at SWAYAM	60	40	100	6	4	2	
5		BCAH-306	Practical (Based on BCAH-301 and BCAH-302)	50	-	50	04 <u>Virtual (VR)</u>			
			Total			550	<u>30+04</u>	<u>20</u>	<u>06</u>	<u>04</u>

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Note: (1) The students will have the choice to opt a course under the category of Elective Courses available within the UTD (ICS, VUU) or in other UTDs but from same level of the programmes. (2)An alternative choice will also be available to the students to opt a course in each semester under elective-generic category including skill development course from Massive Open Online Courses (MOOCs) available at SWAYAM plate form. (3) The student can also opt a course under Elective- Discipline Centric category from Massive open online courses (MOOCs) available at SWAYAM plate form. In such cases, the provisions “Ordinance 14 : Choice Based Credit System” shall be applicable and the conditions mentioned therein will need to be satisfied by the student if they opt courses from Massive Open Online Courses (MOOCs) available at SWAYAM plate form.

BCA (Hon’s) - FOURTH SEMESTER

S N	Course Type	Course code	Title	End term sem Exam	Inter nal	Max Mark s	Credits*	Distribution of Credits		
								C	L	T
1	Core Course	BCAH-401	Programming with JAVA	60	40	100	6	4		2
		BCAH-402	Computer Graphics	60	40	100	6	4	2	
2	Course for Ability Enhancem ent & skill Developme nt (AE & SD)	BCAH-403	Presentation and Personality Development skills	60	40	100	6	4	2	
Choose any one From BCAH-404E1 and 404E2										
3	Elective Discipline Centric	BCAH- 404E1	Internet and E- Commerce	60	40	100	6	4	2	
		BCAH- 404E2	Managerial Economics	60	40	100	6	4	2	
Choose any one From BCAH-405E1 and 405E2										
4	Elective Generic Categories	BCAH- 405E1	Software Engineering	60	40	100	6	4	2	
		BCAH- 405E2	Any Course from Massive Open Online Courses (MOOCs)available at SWAYAM	60	40	100	6	4	2	
5		BCAH- 406	Practical (Based on BCAH- 401)	50	-	50	04 <u>Virtual</u> <u>(VR)</u>			
			Total			550	<u>30+04</u>	<u>20</u>	<u>08</u>	<u>02</u>

C=Credit Per Week) / (L = Lectures Per Week)/ (T & PW =Tutorials & Practical Work per week)

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BCA (Hon’s) - FIFTH SEMESTER

S N	Course Type	Course code	Title	End term sem Exam	Inter nal	Max Mark s	Credits*	Distribution of Credits		
								C	L	T
1	Core Course	BCAH-501	Advanced JAVA	60	40	100	<u>6</u>	<u>4</u>	<u>2</u>	
		BCAH-502	Artificial Intelligence	60	40	100	<u>6</u>	<u>4</u>	<u>2</u>	
2	Course for Ability Enhancem ent & skill Developme nt (AE & SD)	BCAH-503	Minor Project	60	40	100	<u>6</u>			<u>6</u>
Choose any one From BCAH-504E1 and 504E2										
3	Elective Discipline Centric	BCAH- 504E1	Data Mining	60	40	100	<u>6</u>	<u>4</u>	<u>2</u>	
		BCAH- 504E2	Internetwork Application	60	40	100	<u>6</u>	<u>4</u>	<u>2</u>	
Choose any one From BCAH-505E1 and 505E2										
4	Elective Generic Categories	BCAH- 505E1	Network Security	60	40	100	<u>6</u>	<u>4</u>	<u>2</u>	
		BCAH- 505E2	Any Course from Massive Open Online Courses (MOOCs)available at SWAYAM	60	40	100	<u>6</u>	<u>4</u>	<u>2</u>	
5		BCAH- 506	Practical (Based on BCAH- 501)	50	-	50	<u>04</u> <u>Virtual</u> <u>(VR)</u>			
			Total			550	<u>30+04</u>	<u>16</u>	<u>06</u>	<u>08</u>

C=Credit Per Week) / (L = Lectures Per Week)/ (T & PW =Tutorials & Practical Work per week)

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BCA (Hon’s) - SIXTH SEMESTER

S N	Course Type	Course code	Title	End term sem Exam	Inter nal	Max Mark s	Credits*	Distribution of Credits		
								C	L	T
1	Core Course	BCAH-601	ASP.NET Technology using C#	60	40	100	<u>6</u>	<u>4</u>		<u>2</u>
		BCAH-602	Programming in Python	60	40	100	<u>6</u>	<u>4</u>		<u>2</u>
2	Major Project	BCAH-603	Valuation of Dissertation	60	40	100	<u>6</u>			<u>6</u>
		BCAH-604	Final presentation/ Seminar	60	40	100	<u>6</u>			<u>6</u>
		BCAH-605	Final Viva-voce examination	60	40	100	<u>06</u>			<u>6</u>
		BCAH-606	Practical (Based on BCAH-601 and BCAH-602)	50	-	50	<u>4</u> Virtual (VR)			
			Total			550	<u>30+04</u>	<u>08</u>		<u>22</u>

BCAH-101 Programming in C

UNIT-1

Problem identification, analysis, design, coding, testing & debugging, implementation, modification & maintenance, algorithms & flowcharts, Characteristics of a good program – accuracy, simplicity, robustness, portability, minimum resource & time requirement, modularization; Rules/conventions of coding, documentation, naming variables; Top down design; Bottom-up design.

UNIT-2

History of C, Structure of a C program, Data types, Constant & Variable, Operators & expressions, Control Constructs – if-else, for, while, do-while, Case statement, Arrays, Formatted & unformatted I/O, Type modifiers & Storage classes, Ternary operator, Type conversion & type casting, Priority & associativity of operators.

UNIT-3

Functions, Arguments, return value, Parameter passing – call by value, call by reference, return statement, Scope, visibility and life time rules for various types of variable, static variable, calling a function, Recursion – basics, comparison with iteration, tail recursion, when to avoid recursion examples.

UNIT-4

Special constructs – break, continue, exit(), goto& labels; Pointers - &and * operators, pointer expression, pointer arithmetic, dynamic memory management functions like malloc(), calloc(), free(), String, Pointer to function, Function to parameter, Structure – basic, declaration, membership operator, pointer to structure, referential operator, self-referential structures, structure within structure, array in structure, array of structures, Union – basic, declaration; Enumerated data type, Typedef, Command line arguments.

UNIT-5

File handling and related functions: printf&scanf family, C preprocessor – basics, # Include, # define, # undef, conditional compilation directive like #if, #else, #endif, #ifdef and #ifndef, Variable argument list functions.

Reference Books:

1. Kerninghan& Richie: The C Programming language, PHI
2. Cooper Mullish: The Spirit of C, Jaico Publishing House, Delhi
3. Kanetkar Y: Let us C
4. Kanetkar Y: Pointers in C.

BCAH-102 Mathematics-I

UNIT-1

Set Theory: Introduction, Sets and Elements, Universal Set and Empty Set, Subsets, Venn Diagrams. Relations: Introduction, Product Sets, Relations, Pictorial Representation of Relations, Composition of Relations, Types of Relations, Partial Ordering Relations.

UNIT-2

Functions: Introduction, One-to-One, Onto, and Invertible Functions, Cardinality. Logic and Propositional Calculus: Introduction, Propositions and Compound Propositions, Basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions.

UNIT-3

Counting: Introduction, Basic Counting Principles, Factorial Notation, Binomial Coefficients, Permutations and Combinations. Pigeon hole Principle.

UNIT-4

Graph Theory: Introduction, Graphs and Multigraphs, Subgraphs, Paths, Connectivity, Weighted Graphs, Complete, Regular and Bipartite Graphs. Directed Graphs: Introduction, Rooted Trees, Graph Algorithms: Depth first and Breadth-First Searches.

UNIT-5

TREES AND CUT - SETS : Paths and Circuits, Shortest Paths, Eulerian Paths and Circuits, Hamiltonian Paths and Circuits. Rooted Trees, Path Lengths in Rooted Trees, Binary Search Trees. Spanning Trees, Minimum Spanning Trees.

Reference Books:

1. Elements of Discrete Mathematics, C.L.Liu, Second Edition, TMH
2. Discrete Mathematics and its applications, Kenneth H. Rosen, (Fifth Edition), Tata McGraw Hill Publishing Company.
3. Theory and Problems of Discrete Mathematics, Semmour Lipschutz, Marc Lipson, Second Edition, Schaum’s Outline, T.M.H.

BCAH-103 Financial Accounting

UNIT-1

The basic Financial Accounts, types of accounts, Rules of Entries of transactions, Journals. Cash Book – Types, Format of Cash Book, Balancing of Cash Book, Subsidiary books – Purchase, Sales. Purchase return and sales return. Ledger, posting of entries.

UNIT-2

Trial Balance, Rectification of errors, adjustment entries. Depreciation and Inflation.

UNIT-3

Principles of Cost Accounting, Valuation of Stocks, Allocation of Overheads, Methods of material issues.

UNIT-4

Pay roll department, preparation of pay roll, Preparation of wage record, Methods of payments of wages, overview of computerized method for payroll preparation.

UNIT-5

Inventory account and store record, inventory or stock control and cost accounting, Department demand and supply method of stock control. Classification and condition of material Report on material handling. Overview of computerized accounting process – Introduction to accounting system software, their features and some basic operations.

Reference Books:

1. Mazda, Engineering Management, Addisen Wesley
2. S P Gupta, Management Accounting
3. I.M.Pandey, Financial Management, Vikas Publication.

BCAH–104 E1 Introduction to Information Technology

UNIT-1

Computer Fundamental: Characteristics of Computers, History of Computer, Evolution of Computers, Computer Generations, Types of Computer, Components of a Computer: Registers, Instruction Set, Bus Architecture, Computer Hardware: Input Devices, Output Devices, Storage Devices: Primary Storage capacity, Memory Types, Memory Measuring Units, Secondary Storage Device

UNIT-2

Software and Computer Applications: Software & Software Types, Computer Languages, Compiler, Interpreter, Editor, Computer Ethics, Computer applications, Introduction of Programming: Procedure Oriented Programming, Object oriented programming, Concepts used in OOP, Benefits of OOP, Main advantages and disadvantage of OOP, Applications of OOP, OOP vs. POP.

UNIT-3

Operating System Overview: Computer System Startup, Computer System Structure, Computer System Components, Operating System Classifications, Operating System Services, Major Functions of Operating system, Process Management, CPU Scheduling, Scheduling Criteria. Memory and File Management: Memory Management Requirements, Swapping, Memory Management Techniques, Virtual Memory, File Management, File Access Methods, Protection.

UNIT-4

Introduction to DBMS: File System, Traditional File Oriented Approach, DBMS- Advantages and Disadvantages, Role of DBMS, Three views of data, DBMS Architecture, Data Models, Data Independence, Major components of DBMS, Data Dictionary, Types of Users, DBMS applications, Keys in Databases, Database Languages.

UNIT-5

Introduction to Computer Networks: Computer Network Definition, Importance of Networking, Types of Networks, Network Topology, Advantages and Disadvantage of Computer Networks, Applications of computer networks, Reference Model, Internet, Introduction to Internet Technology, Electronic Mail, World Wide Web.

Reference Books:

1. Operating Systems Concepts, A. Silberschatz, P.GaIvin, G.Gagne, John Wiley & Sons
2. Object Oriented Programming in C++, Robert Lafore, Galgotia Publication.
3. Data base management systems vol. 1., Date C.J.
4. Fundamental of Computer Science & IT, Singh Umesh Kumar, Jain S., Maheshwari A., SSDN Publications New Delhi,
5. Data Communications and Networks, Godbole A, Tata McGraw-Hill Publications.

BCAH–104 E2 Internet and its Applications

UNIT-1

Introduction to Computers Programming Language, types, History of Internet, Personal Computers, History of World Wide Web- Micro software .NET Java-Web resources.

UNIT-2

Web Browsers- Internet Explorer- connecting to Internet, Features of Internet explorer, Searching the Internet- online help and tutorials, File Transmission Protocol (FTP), Browser settings.

UNIT-3

Attaching a file, Electronic mail, Creating an E-mail id, Sending and Receiving mails, attaching a file, Instance messaging, other web browsers.

UNIT-4

Introduction to HTML headers, Linking- Images, special characters and line breaks, unordered lists, simple HTML programs.

UNIT-5

E-marketing, consumer tracking, Electronic advertising, search engine, CRM, credit card payments, Digital cash and e-wallets micro payments- smart card

Reference Books:

1. Internet and World Wide Web Third edition H.M.Deitel, P.J. Deitel and A.B.Goldberg- PHI
2. The Internet- Complete Reference Harley hahn, Tata McGraw Hill

BCAH-105 E1 Digital Electronics

UNIT-1

Data types and Number systems, Binary number system, Octal & Hexa-decimal number system, 1's & 2's complement, Binary Fixed-Point Representation, Arithmetic operation on Binary numbers, Overflow & underflow, Floating Point Representation, Codes, ASCII, EBCDIC codes, Gray code, Excess-3 & BCD, Error detection & correcting codes.

UNIT-2

Logic Gates, AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates, Boolean Algebra, Basic Boolean Law's, DeMorgan's theorem, MAP Simplification. Minimization techniques, K-Map, Sum of Product & Product of Sum.

UNIT-3

Combinational & Sequential circuits, Half Adder & Full Adder, Full subtractor, Flip -flops- RS, D, JK & T Flip-flops, Shift Registers, RAM and ROM, Multiplexer, Demultiplexer, Encoder, Decoder, Idea about Arithmetic Circuits, Program Control, Instruction Sequencing.

UNIT-4

I/O Interface, Properties of simple I/O devices and their controller, isolated versus memory-mapped I/O, Modes of Data transfer, Synchronous & Asynchronous Data transfer, Handshaking, Asynchronous serial transfer, I/O Processor

UNIT-5

Auxiliary memory, Magnetic Drum, Disk & Tape, Semi-conductor memories, Memory Hierarchy, Associative Memory, Virtual Memory, Address space & Memory Space, Address Mapping, Page table, Page Replacement, Cache Memory, Hit Ratio, Mapping Techniques, Writing into Cache.

Reference Books:

1. BARTEE, "Digital Computer Fundamentals " TMH Publication
2. MALVINO, " Digital Computer Electronics " TMH Publication
3. MORRIS MANO, "Computer System Architecture PHI Publication

BCAH-201 Object Oriented Programming using C++

UNIT-1

Object Oriented Systems Development : Introduction to traditional programming with C. Objectives of OOP, Object Oriented Analysis, Object Oriented Programming in C++: Concepts of Objects, Classes, Data Abstraction, Encapsulation, Inheritance, Polymorphism, Dynamic Binding and Message passing. Tokens, Expressions and Control Structures.

UNIT-2

Classes & Objects: Classes, Structure & classes, Union & Classes, Friend function, Friend classes, Inline function, Scope resolution operator, Static class members: Static data member, Static member function, passing objects to function, Returning objects, Array of objects.

UNIT-3

Constructor & Destructor: Introduction, Constructor, Parameterized constructor, Multiple constructor in a class, Constructor with default argument, Copy constructor, Default Argument, Destructor.

Function & operator overloading: Overloading and information hiding, Function overloading, Operator overloading

UNIT-4

Inheritance: Inheritance, Derived and base classes, Single, Multilevel, Hierarchical, Hybrid Inheritance, Protected member, overriding member function, class hierarchies, multiple inheritance, Containership, Virtual base class

UNIT-5

Polymorphism : virtual functions, late binding, pure virtual functions, abstract classes, this pointer, templates, function templates, Class templates.

The C++ I/O system basics: C++ streams, The basic stream classes: C++ predefined streams.

Reference Books:

1. Object-Oriented Programming with C++: E. Balagurusamy, TMH, 2005
2. Object Oriented Programming in C++, Robert Lafore, Galgotia Publication.
3. Object Oriented Programming, Tomothy Budd, Pearson education.

BCAH-202 Mathematics-II

UNIT-I

Types of errors, Error approximation, truncation error, rounding error. Solution of transcendental equation by: Bisection, false position, Newton-Raphson Methods

UNIT-2

Automata: Basic machine, FSM , Transition graph, Transition matrix, Deterministic and nondeterministic FSM’S, Equivalence of DFA and NDFA, Two-way finite automata.

UNIT- 3

Regular Expressions, Finite Automata with Output, Applications of Finite Automata, Closure Properties of Regular Sets.

UNIT-4

Context Free Grammars: Motivation and Introduction, Context-free Grammars, Derivation trees and Ambiguity, Normal Forms (Chomsky Normal Form ,Unit Production Chomsky Normal Forms, Closure properties of Context Free Languages, Construction of Reduced Grammars, Elimination of null production.

UNIT-5

Turing Machines: Introduction, TM model, representation and languages acceptability of TM fUniversal Turing Machine.

Reference Books:

1. Introduction to Automata Theory, Languages & Computation, J E Hopcraft & JD Ullman, Narosa Publications.
2. Theory of Computer Science, KLP Mishra & N Chandra Sekhar, PHI
3. Mathematical Foundations of Computer Science, Beckman
4. John C Martin, “Introduction to languages and theory of computation”, McGraw Hill
5. Anami & Aribasappa , “ Formal Languages and Automata Theory”,Wiley India

BCAH-203 Office Automation and PC Software

UNIT-1

MS Windows: Introduction to MS Windows; Features of windows; Various versions of Windows & its uses; Working with Windows; My computer & Recycle bin; Desktop, Icons and Windows Explorer; Screen description & working styles of Windows; Dialog Boxes & Toolbar; Working with files & Folders; Simple operations like copy, delete, moving of files and folders from one drive to another, Shortcuts & Autostarts; Accessories and Windows Settings using Control Panel-setting common devices using control panel, modem, printers, audio, network, fonts, creating users, internet settings, Start button & Program lists ;Installing and Uninstalling new Hardware & Software program on your computer.

UNIT-2

Office Packages – Office activates and their software requirements, Word-processing, Spreadsheet, Presentation graphics, Database, introduction and comparison of various office suites like MS Office, Lotus Office, Star Office, Open Office etc.

MS Word Basics – Introduction to MS Office; Introduction to MS- Word; Features & area of use, working with MS- word; Menus & Commands; Toolbars & Buttons; Shortcut 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.

UNIT-3

Advanced Features of MS- word- Spell check, Thesaurus, Find & Replace; Headers & Footers: Inserting- Page Number, Pictures, Files, Autotexts, Symbols etc.; working with columns, Tab& Indents; Creation and working with Tables including conversion to and from text; Margins and Space management in Documents; Adding references and Graphics; Mail Merge, Envelops & mailing Labels. Importing and Exporting to and from various formats.

UNIT-4

MS Excel: Introduction and area of use; working with MS Excel: concept of workbook and worksheet; 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 Worksheet; Column Freezing, Labels, Hiding, Splitting etc.; Using different features of Data and Text; Use of Formulas, Calculation & Functions; Cell formatting including Borders and Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with Various options.

UNIT-5

MS PowerPoint: Introduction and area of use; Working with MS PowerPoint; Creating a New Presentation; Working with Presentation; Using Wizards; Slides &its Different Views; Inserting, Deleting and Copying of Slides; Working with Notes, Handouts; Columns and Lists; Adding Graphics, Sounds and Movies to a slide; Working with PowerPoint Objects; Designing and Presentation of a Slide Show; Printing Presentations; Notes, Handouts with print options.

Reference Books:

1. Windows XP Complete Reference. BPB Publications
2. MS Office XP complete BPB Publication
3. MS Windows XP Home edition complete, BPB Publications

BCAH-204 E1 Data Base Management System

UNIT-1

DBMS Concepts and architecture Introduction, Review of file organization techniques, Database approach v/s Traditional file accessing approach, Advantages of database systems, Data models, Schemas and instances, Data independence, Functions of DBA and designer. Entities and attributes, Entity types, Value, Sets, Key attributes, Relationships, Defining the E-R diagram of database, **Various data models:** Basic concepts of Hierarchical data model. Network data model, and Relational data model, Comparison between the three types of models.

UNIT-2

Relational Data models: Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints, Intension and Extension, **Relational Query languages:** Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union etc.

UNIT-3

Types of relational calculus i.e. Tuple oriented and domain oriented relational calculus and its operations. SQL: Data definition in SQL, update statements and views in SQL QUEL & QBE: Data storage and definitions. Data retrieval queries and update statements etc.

UNIT-4

Data Base Design: Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and losslessjoin, problems with null valued and dangling tuples, multivalued dependencies. Distributed databases, protection, security and integrity constraints, concurrent operation on databases, recovery, transaction processing, basic concepts of object oriented data base system and design.

UNIT-5

Case study of relational database management systems: Oracle and Microsoft access, Oracle tools.

Reference Books:

1. Data Base Management System by C.J. Date
2. Data Base Management System by Ullman
3. Fundamental of database system byElmasri/Navathe the Benjamin / Cunnings Publishing company inc..
4. Data base design by GioWiederhold, McGraw Hill
5. Fundamental of Data Base Management System by Leon & Leon, Vikas Publishing House Pvt. Ltd.

BCAH-204 E2: Internet Programming

UNIT-1

Introduction to Internet Programming- Client-Server model, Browsers-Graphical and Hypertext Access to the Internet, HTTP–Hyper Text Transfer Protocol (how it actually works), The Phases of Web Site Development

UNIT-2

Creating Internet World Wide Web pages- HTML - Hypertext Markup Language , Basic HTML Concepts, HTML: Structured Language ,headers, body, html tags, tables , Text, graphics, sounds, video clips, multi- media ,Client side image mapping

UNIT-3

HTML forms programming: Building a form, Text fields and value, size, max length html buttons, radio, checkboxes, Selection lists.

CSS: Introduction To Style sheet, types of style sheets- Inline, External, Embedded CSS, text formatting properties, CSS Border, margin properties, Positioning Use of classes in CSS, color properties, use of <div>&

UNIT-4

Intro to script, types, intro of JavaScript, JavaScript identifiers, operators, control & Looping structure, Intro of Array, Array with methods, Math, String, Date Objects with methods User defined & Predefined functions, DOM objects, Window Navigator, History, Location, Event handling, Validations On Forms

UNIT-5

Intro & features of XML, XML writing elements, attributes etc. XML with CSS, DSO, XML Namespaces XML, DTD, XML Schemas, Writing Simple sheets using XSLT, SAX & DOM Parsers, SOAP Introduction.

Reference Books:

1. Joe Fawcett,Danny Ayers,Liam R.E. Quin, “Beginning XML” Wrox Press, 5th Ed., 2012
2. Deitel & Deitel, “XML how to program”, Pearson, 2000
3. Hofstetter fred , “Internet Technology at work”, Osborne pub. , ISBN : 9780072229998, 2004
4. Ivan Bayross , “HTML, DHTML, JavaScript, Perl & CGI” ,BPB pub. 3rd Ed.,2004
5. Ivan Bayross, “Web enabled commercial application development using HTML, DHTML, JavaScript, PERL-CGI”, BPB pub., 2nd Ed., 2000

BCAH-205 E1 Operating Systems

UNIT-1

Introduction to Operating Systems: Operating system services, multiprogramming, time-sharing system, storage structures, system calls, multiprocessor system. Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, real time scheduling, I/O devices organization, I/O devices organization, I/O devices organization, I/O buffering.

UNIT-2

Process concept: process scheduling, operations on processes, threads, inter-process communication, precedence graphs, critical section problem, semaphores, problems of synchronization, Deadlock problem: deadlock characterization, deadlock prevention. deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling.

UNIT-3

Concepts of memory management: logical and physical address space, swapping, contiguous and Non- contiguous allocation, paging, segmentation, and paging combined with segmentation.

UNIT-4

Concepts of virtual memory, demand paging, page replacement algorithms. allocation of frames, thrashing, demand segmentation, Security threads protection, Intruders- Viruses-trusted system,

UNIT-5

Disk scheduling, file concepts, file access methods, allocation methods, directory systems, file protection, introduction to distributed systems and parallel processing case study.

Reference Books:

- i. Operating System by Silberschatz
- ii. Operating System by Deitel
- iii. Modern operating system by Tanneubacem.

BCAH-301 Data Structures using C++

UNIT-1

Stacks and Queues: 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. Introduction to queues, Primitive Operations on the Queues, Queue as an abstract data type, Circular queue, Dequeue, Priority queue, Applications of queue.

UNIT-2

Linked Lists: Introduction to the Linked List, Defining & implementing linked lists with creation, insertion and deletion operations in C++, Types of Linked List, Application of Linked List.

Searching algorithms: Sequential search & Binary search algorithms, Implementation in C++.

UNIT-3

Sorting: Analysis of algorithm, complexity using big 'O' notation, insertion sort, Selection sort. Quick sort, Bubble sort, Heap sort.

Hashing and Indexing: Hash Table, Collision resolution Techniques, index techniques, cylinder-surface indexing, tree indexing-B-trees, trie indexing

UNIT-4

TREES: Basic Terminology, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary Trees 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.

UNIT-5

Graphs: 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.

Reference Books:

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

BCAH-302 Programming with VB.NET

UNIT-1

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.

UNIT-2

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.

UNIT-3

Working with Forms : Loading, showing and hiding forms, controlling One form within another. Using MDI form. Windows Form Control (with Properties, Methods and events): Textbox, Rich Text Boxes, Label, Link Label, Button, Checkbox, Radio Button, Panel, Group Box, Picture Box, Listbox, Combobox, Check Listbox, scroll bar, Timer. Advance Controls: Menus, Context Menus , Built-in Dialog Box: OpenFileDialog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog, Printing. ListView, TreeView, toolbar, StatusBar.

UNIT-4

Object oriented Programming: Classes & objects, constructor, destructor, inheritance. Access Specifiers, Interfaces, Polymorphism. Exception Handling: using Try, Catch, Finally, Throw Keywords. Graphics Handling: Using Graphics & Pen classes for drawing colors and figures. File Handling: Opening or Creating a File, Writing & Reading Text.

UNIT-5

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.

Generate Reports Using CrystalReportViwer.

Reference Books:

1. VB.NET Programming Black Book by steven holzner –dreamtech publications
2. Mastering VB.NET by Evangelos petroutsos- BPB publications
3. Introduction to .NET framework-Worx publication

BCAH-303 Communication Skills

UNIT-1

Meaning and process of communication, importance of effective communication, communication situation and communication skills, barriers to communication.

UNIT-2

Objectives of communication, types of communication, principles of communication, essentials of effective communication.

UNIT-3

Media of communication: written, oral, face-to-face, visual, audio-visual, merits and demerits of written and oral communication, preparing for oral presentation, conducting presentations.

UNIT-4

Developing communication skills, interview- how to face and how to conduct. Preparing of biodata, seminar, paper, bibliography, group discussion, official correspondence.

UNIT-5

Mechanics of writing, paragraphing, precise, report writing, technical reports, length of written reports, organizing reports, writing technical reports.

Reference Books:

1. Essentials of Business Communication by Rajendra Pal and J.S.Korilahalli, Sultan Chand & Sons Publishers, New Delhi.
2. Business Communications by U.S. Rai &S.M.Rai, Himalaya Publishing House.
3. Writing a Technical Paper by Menzal and D.H.Jones, McGraw Hill, 1960.
4. Business Communication: Strategy and Skill, Prentice Hall New Jersey, 1987.

BCAH-304 E1 Systems Analysis and Design

UNIT-1

System Concept: Definition, Characteristics, Elements of system, Physical and abstract system open and closed system, man-made information systems,

System Development Life Cycle: Various phases of system development, Considerations for system planning and control for system success. **System Planning:** Base for planning a system, Dimensions of Planning.

UNIT-2

Initial Investigation: Determining users 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:** Data analysis cost and benefit analysis of a new system. Categories determination and system proposal.

UNIT-3

Tools of structured Analysis: Logical and Physical models context, diagram, data dictionary, data diagram, form driven methodology, IPO and HIPO charts, Gantt charts, system model, pseudo codes, Flow charts, system flow chart, run flow charts etc., decision tree, decision tables, data validation. **Input/ Output and Form Design:** Input and output form design methodologies, menu, screen design, layout consideration.

UNIT-4

Management standards Systems analysis standards, Programming standards, Operating standards. Documentation standards 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. System security: Data Security, Disaster/ recovery and ethics in system development, threat and risk analysis, System audit.

UNIT-5

Organisation of EDP: Introduction, Job Responsibilities & duties of EDP, Personnel- EDP manager, System Analyst, Programmers, Operators etc. Essential features in EDP Organization. **Selection of Data Processing Resources:** purchase, lease, rent-advantages and disadvantages. Hardware and software procurement – In-house purchase v/s hiring and lease.

Reference Books:

1. System Analysis & Design by V K Jain, Dreamtech Press
2. Modern System Analysis & Design by A Hoffer. F George- S Valaciahlow Priced Edn. Pearson Education.
3. Information Technology & Computer Applications. by V.K.Kapoor, Sultan Chand & Sons, New Delhi.

BCAH-304 E2 Management Information System

UNIT-1

Meaning, Nature, Need, Role, Importance, Evolution of Management Through Information system. Structure of Management Information System.

UNIT-2

Relatedness of MIS with management activities, Management functions and decision making, Information System in Business and Management.

UNIT-3

Development of MIS- Methodology and Tools/ Techniques for systematic designing, implementation, evaluation. modification of MIS,

UNIT-4

A study of major financial, production, manpower and marketing MIS and case Studies.

UNIT-5

Advanced MIS-concept, need and problems in achieving advanced MIS, Decision support System. Rationale of computer application, Decision support system (DSS).

Reference Books:

1. Murdick, R.G., Ross, J.E. & Claggett, J.R.: Information systems for Modern Management, PHI
2. Thomas, R. & Prince: Information systems for planning and control.
3. Wigarders, K., Syensson, A., Sehong. I., Rydin, A. & Dahlgre. G. Structured Analysis & Design of Information system, Mcgraw Hill Book company, 1986.
4. Aktas : structured analysis and design of information system, PHI
5. Spargue and Watson : Decision Support System ,2nd Edn. Prentice Hall international. 1989.
6. David : Applied Decision Support, Prentice hall international, 1988.
7. Kanter, J. : Management information system, 3rd Edn. Prentice Hall India, 1984.
8. Bennett, J.L.: Building Decision support System, Addison. Wesley publ. comp. 1983
9. Lucas: Analysis, Design and implementation of Information 3rd Edn. Mcgraw Hill Book comp,
10. Senn. : Analysis and Design of Information System. Mcgraw Hill Book comp.

BCAH-305 E1 Data Communication and Computer Networks

UNIT-1

Introduction: Theoretical Model for Communication, analog and digital signals Bandwidth, Noise, Channel Capacity, Data-rate, Concepts of Circuit Switching, Message switching and Packet switching with their timing diagrams, comparison of switching techniques, ISDN.

UNIT-2

Evolution of Computer Networks Layered: Network architecture, OSI Layers Model, transmission media topology, error detection & Correction techniques, Parity checks, CRC, Asynchronous and synchronous transmission, TDM, FDM.

UNIT-3

Data Link Layer: Different Types of line discipline, simplex, half duplex and full duplex.**Flow control:** stop and wait protocol, sliding Window Protocol with their efficiency, ARQ techniques & their performances HDLC.

UNIT-4

LAN: Static & Dynamic channel allocation, Media access control for LAN & WAN; **ALOHA:** pure, slotted ALOHA, CSMA, CSMA/CD,**IEEE 802 standards for LAN & MAN:** 802.3, 802.4, 802.5, 802.6 and 802.2 & their **comparison Fast LANs:** fast Ethernet, FDDI.

UNIT-5

Routing: Definition, Elements of routing techniques, Least Cost Routing algorithm,Dijkstra’s algorithm, Bellman-ford algorithm, Routing Strategies, Congestion Control encryption & description techniques, Internet working, Internet and Intranet.

Reference Books:

1. Computer Networks Tanenbaum A. S. PHI.
2. LANs- Keizer
3. Computer Networks - Stalling w., PHI.

BCAH-401 Programming with JAVA

UNIT-1

C++ Vs JAVA, JAVA and Internet and WWW, JAVA support systems, JAVA environment, JAVA program structure, Tokens, Statements, JAVA virtual machine, Constant & Variables, Data Types, Declaration of Variables, Scope of Variables, Symbolic Constants, Type Casting. Operators: Arithmetic, Relational, Logical Assignments, Increment and Decrement, Conditional, Bitwise, Special, Expressions & its evaluation. If statement, If...Else... statement, Nesting of If. . .else. . . statements, else...if Ladder, Switch, ? operators, Loops- While, Do, For, Jumps in Loops, Labelled Loops.

UNIT-2

Defining a Class, Adding Variables and Methods, creatingObjects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting ofMethods. Inheritance: Extending a Class, Overriding Methods, Final Variables and Methods, Final Classes, Finalize Methods, Abstract methods and Visibility Control.

UNIT-3

Arrays: One Dimensional & two Dimensional strings, Vectors, wrapperClasses,Defining Interface Extending Implementing Interface, Accessing Interface Variable, System Packages, Using System Package, adding a Class to aPackage, Hiding Classes.

UNIT-4

Creating Threads, Extending the Threads Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the Runnable Interface.

UNIT-5

Local and Remote Applets Vs Applications, Writing Applets, Applets Life Cycles,creating an Executable Applet, designing a Web Page, Applet Tag, Adding Applet to HTML File. Running the Applet, Passing Parameters to Applets, Aligning the Display, HTML Tags & Applets Getting Input from the User.

Reference Books:

1. Balaguruswamy, "Programming in Java", 2nd Edition, TMH Publications
- 2."Peter Norton. Guide To Java Programming,Techmedia Publications

BCAH-402 Computer Graphics

UNIT-1

Introduction to Raster scan displays, Storage tube displays, refreshing, flickering, interlacing, color monitors, display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball, tablets and joysticks.

UNIT-2

Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham's Algorithm, Circle drawing, general method, Bresenham's Algorithm, Mid Point Algorithm, curves, parametric function, Bezier Method, B-spline Method.

UNIT-3

2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object on 2D screen.

UNIT-4

Point Clipping. Line Clipping Algorithms, Polygon Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection, phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV etc.

UNIT-5

Multimedia components, Multimedia Hardware, SCSI, IDE, MCI, Multimedia data and file formats, RTF, TIFF, MIDI, JPEG, DIB, MPEG, Multimedia Tools, Presentation tools, Authoring tools, presentation.

Reference Books:

1. James E. Shuman, "Multimedia in Action" Thomson / Vikas Publishing House.
1. Tay Vaughan " Multimedia: making it work" Tata McGraw Hill 1999« 4th Edition
2. Prabhat kAndleigh, Kiran Thakral "Multimedia System Design", PHI
3. Donald Hearn and M.P. Becker "Computer Graphics" PIR Pub.
4. FoleyVandam,Feiner, Hughes "Computer Graphics Principle & Practice" Adison Wesley,2/e. 1997
5. Principles of Computer Graphics "Rogers" TMH.

BCAH-403 Presentation and Personality Development skills

UNIT-1

Introduction: Personality Development- concept, types, role and impact, developing self awareness, projecting a winning personality.

UNIT-2

Personality Assessment: Personality assessment and testing- resume writing- types, contents, formats, interviewing skill, group discussion, JAM sessions, persuasive communication.

UNIT-3

Communication Skill: Practice on oral/spoken communication skill and testing- voice and accent, feedback and questioning techniques, objectives in an argument.

UNIT-4

Presentation Skills: skills and techniques, etiquette, project/assignment presentation, role play and body language, impression management.

UNIT-5

Personality Development Activities: Leadership activities, motivation activities, team building activities, stress and time management techniques, creativity and ideation.

Reference Books:

1. Business Communication- Royan and V.lesikar, John D. Pettit, JR.Richard D.Irwin, INC.
2. Personality Development and Soft Skills- Barun K. Mitra, Oxford Publisher.
3. Personality Development- Rajiv K.Mishra, Rupa Publisher.

BCAH-404 E1 Internet and E-Commerce

Unit-I

Internet: Evolution, Concepts, Internet Vs Intranet, Growth of Internet, ISP, ISP in India, Types of connectivity - Dial-up, Leased line, DSL, Broadband, RF, VSAT etc., Methods of sharing of Internet connection, Use of Proxy server. Internet Services USENET, GOPHER, WAIS, ARCHIE and VERONICA, IRC. WORLD WIDE WEB (WWW) - History, Working, Web Browsers, Its functions, URLs, web sites, Domain names, Portals. Concept of Search Engines, Search engines types, searching the Web, Web Servers, TCP/IP and others main protocols used on the Web. E-Mail: Concepts, POP and WEB Based E-mail, merits, address, Basics of Sending & Receiving, E-mail Protocols, Mailing List, Free E- mail services, e-mail servers and e-mail clients programs.

Unit-II

Concepts of Hypertext, HTML introduction, features, uses & versions Using various HTML tags, Elements of HTML syntax, Head & Body Sections, inserting texts, Text alignment, using images in pages, Hyperlinks text and images, bookmarks, Backgrounds and Color controls, creating and using Tables in HTML, and presentation, use of font size & Attributes, List types and its tags. Cascading Style sheets defining and using simple CSS.

Unit-III

Introduction to WYSIWYG Design tools for HTML, Overview of MS FrontPage, Macromedia Dream weaver, and other popular HTML editors, designing Web sites using MS FrontPage (using at least FrontPage 2000).Use of Frames and Forms in web pages, Image editors, Issues in Web site creations & Maintenance, Web Hosting and publishing Concepts, Hosting considerations, Choosing Web servers Linux Vs Windows Web servers, Choosing Domain names, Domain name Registration, Obtaining space on Server for Web site, FTP software for upload web site. Add your website on search engines.

Unit-IV

JavaScript Overview, JavaScript and the WWW, JavaScript vs. VB Script, JavaScript vs.Java, JavaScript versions, Script element,. Functions: Functions introduction, Calling functions. JavaScript Comments, Variables: Variables overview, declaring variables, Types of variables, Casting variables, Alert box, Prompt & confirm. Expressions: Arithmetic operators, Assignment operators, Logical operators, Expressions and precedence, Statements: If statement, for statement, while statement, Break/Continue Creating arrays/event handlers, JavaScript Object model, Object and Events in JavaScript – OnClick, On Mouse Over, On Focus, OnChange, On Load etc. Getting data with forms.

Unit—V

E - Commerce an introduction, Concepts, Advantages and disadvantages, Technology in E-Commerce, Internet & E-business, Applications, Feasibility & various constraints.E-transition challenges for Indian corporate, the Information Technology Act 2000 and its highlights related to e-commerce.

Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, Digital Token-Based Electronic Payment Systems, Smart Cards and Electronic Payment Systems, Credit Card-Based Electronic Payment Systems, Risk and Electronic Payment Systems.

E-security — Security on the internet, network and web site risks for e-business, use of firewalls, secure physical infrastructure

Reference Books:

1. Frontiers of Electronic Commerce, By- Kalakota, Ravi; Stone, Tom; Whinston, Andrew B, Addison Wesley Publishing Co.
2. E-Commerce an Indian Perspective (Second Edition) — by P. T, Joseph, S.J. PrenticeHall of India
3. Learn HTML in a weekend by Steven E. Callihan, PHI
4. Using HTML By Lee Anne Phillips, PHI
5. SAMS Teach Yourself JavaScript in 24 Hrs., By Michael Moncur. TechMedia

BCA – 404 E2 Managerial Economics

Unit I

Management Concept: Managements, Administration, Organization Management and Administration, Difference and Relationship between Organizations, importance of Management, characteristics of Management

Unit II

Scientific Management, Principles of Management, Process of Management, Functions of Management, Levels of Management, Project Management

Unit III

Decision Making: Introduction and Definition, Types of Decision, Techniques of Decision Making, Decision making under uncertainty, Decision Making under risk

Unit IV

Managerial Economics: Introduction of Managerial Economics- Factors Influencing Manger, Micro and Macroeconomics, Theory of the Cost Theory of the Firm Theory of Production Function, Production System

Unit V

Input-Output Analysis, Micro Economics Applied to plants and industrial undertakings, Productivity, Factors affecting Productivity, Increasing Productivity of Resources.

Reference Books:

1. The Practice of Management :Peter Drucker, Harper and Row
2. Essentials of Management :Koontz Prentice Hall of India
3. Management :Staner Prentice Hall of India
4. Principle & Practice of Management :T.N. Chhabra ; Dhanpat Rai New Delhi
5. Industrial Organisation & Engineering Economics :T.R.Banga & S.C. Sharma, Khanna Publishers
6. Industrial Engineering & Management :O.P. Khanna, Dhanpat Rai
7. Managerial Economics : Joel Dean : Prentice Hall of India

BCA-405 E1 Software Engineering

Unit-I

The Software Product and Software Process: Software Engineering - A Layered Technology, **Software Process Models:** Linear Sequential Model, Prototyping Model, RAD Model Evolutionary Software Process Models: Incremental Model, Spiral Model Component Assembly Model, Formal Methods, Fourth-Generation Techniques.

Unit -II

Systems Engineering: The Systems Engineering Hierarchy, Information Engineering, Information Strategy Planning, Business Area Analysis, **Product Engineering Requirement Analysis Modeling:** Analysis Concepts and Principles, The Elements of the Analysis Model Data Modifying, Functional Modeling and Information Flow and Behavior Modeling, Mechanics of Structured Analysis, Data Dictionary.

Unit-III

Principles, and Methods: TheSoftwareDesignProcess:Design Principles, Design Concepts, Effective Modular Design, Design Heuristics, Design Documentation, Design Methods: Data Design, Architectural Design, Interface Design, Human Computer Interface Design, Procedural Design.

Unit-IV

Software Testing Methods: Software Testing Fundamentals,Test Case Design, Black-BoxTesting, White-Box Testing, Software Testing Strategies: Verification and Validation, Strategic Issues, Unit Testing, Integration Testing, Validation Testing, System Testing.

Unit V

Software Process and Project Metrics: Measures, Metrics and indicators, Metrics in the Process and Project Domains, Software Measurement, Metrics of Software Quality.

Reference Books:

1. Software Engineering: A Practitioner’s Approach by P, S. Pressman Fourth edition 1997,McGraw- HW pub.
2. An integrated Approach to Software Engineering Pankaj Jalote, 1991,Narosa Pub.
3. Software Engineering University Press — by Sonunerville Oxford university press 1996
4. Fundamentals of Software Engineering Leon and Leon Vikas Publishing House Pvt. Ltd.

BCA- V Semester

BCA-501 Advanced JAVA

UNIT-I

The Java Environment: History of Java: Comparison of Java and C++; Java as an object oriented language: Java buzzwords; A simple program, its compilation and execution; the concept of CLASSPATH; Basic idea of application and applet; **Basics:** Data types; Operators- precedence and associativity; Type conversion; The decision making – if, if..else, switch; loops – for, while, do...while; special statements–return, break, continue, labeled break, labeled continue; Modular programming methods; arrays; memory allocation and garbage collection in java keywords. **Object Oriented Programming in Java:** Class; Packages; scope and lifetime; Access specifiers; Constructors; Copy constructor; this pointer; finalize () method; arrays; Memory allocation and garbage collection in java keywords **Inheritance** : Inheritance basics, method overriding, dynamics method dispatch, abstract classes.

UNIT-II

Interfaces : defining an interface, implementing & applying interfaces, variables in interfaces, extending interfaces. **Multithreading and Exception Handling:** Basic idea of multithreaded programming; The lifecycle of a thread; Creating thread with the thread class and runnable interface; Thread synchronization; Thread scheduling; Producer-consumer relationship; Daemon thread, Selfish threads; Basic idea of exception handling; The try, catch and throw; throws Constructor and finalizers in exception handling; Exception Handling.

UNIT-III

Applets: Applet security restrictions; the class hierarchy for applets; Life cycle of applet; HTML Tags for applet.**The AWT:** The class hierarchy of window fundamentals; The basic user interface components Label, Button, Check Box, Radio Button, Choice menu, Text area, Scroll list, Scroll bar; Frame; Layout managers flow layout, Grid layout, Border layout, Card layout. **The Java Event Handling Model:** Java’s event delegation model – Ignoring the event, Self contained events, Delegating. **Events:** The event class hierarchy; The relationship between interface, methods called, parameters and event source; Adapter classes; Event classes action Event, Adjustment Event, Container Event, Focus Event, Item Event, Key Event, Mouse Event, Text Event, Window Event.

UNIT-IV

Input/Output : Exploring Java i.o., Directories, stream classes The Byte stream : Input stream, output stream, file input stream, file output stream, print stream, Random access file, the character streams, Buffered reader, buffered writer, print writer, serialization. **JDBC:** JDBC-ODBC bridge; The connectivity model; The driver manager; Navigating the result set object contents; java.sql Package; The JDBC exception classes; Connecting to Remote database.

UNIT-V

Networking & RMI: Java Networking : Networking Basics : Socket, Client server, reserved sockets, proxy servers, Inet address, TCP sockets, UDP sockets. ; RMI for distributed computing; RMI registry services; Steps of creating RMI Application and an example. **Collections:** The collections framework, collection interfaces, collection classes.

Reference Books:

1. Naughton & Schildt “The Complete Reference Java 2”, Tata McGraw Hill
2. Deitel “Java- How to Program:” Pearson Education, Asia

BCA-502 Artificial Intelligence

Unit-I

Basic Problem solving methods: Production systems-state space search, control strategies. Heuristic search, forward and backward reasoning, Hill climbing techniques Breadth first search, Depth first search, Best search.

Unit-II

Knowledge Representation: Predicate logic, Resolution question Answering, Nonmonotonic Reasoning, statistical and probabilistic reasoning, Semantic Nets. Conceptual Dependency, frames and scripts.

Unit-III

AI languages: Important characteristics of AI languages PROLOG, LISP.

Unit-IV

Introduction to Expert Systems: Structure of an Expert system interaction with an expert, Design of an Expert system.

Unit V

Neural Network: Basic Structure of a neuron, Perception Feed forward, Back propagation, Hopfield Network.

Reference Books:

1. Rich E and Knight K Artificial Intelligence, "TMH New Delhi,
2. Nelsson N.J. Principles of Artificial Intelligence, Springer Verlag, Berlin.
3. Barr A, Fergenbaub EA. and Cohen PR, Artificial Intelligence. Addisonwesley Reading (Mars) 1989.
4. Waterman D.A. A guide to Expertsystem, Adision - Wesley, Reading (Mars) 1986,
5. Artificial Intelligence Hand book, Vol. 1-2, ISA. Research Triangle Park 1989,
6. Kos Ko B Neural Networks and Fuzzy system -pH-
7. Neural Network Design, Martin Hagar, Vikas-Thomson Learning. Vikas Pub. House PVI, Ltd., Delhi.
8. Expert Systems: Principals & Programming, Joseph Giarrantons&Rilay. Vikas- Thomson Learning Vikas Pub. House Pvt. Ltd., Delhi.

BCA-504E1 Data Mining

UNIT-1

Introduction : Data Mining: Definitions, KDD v/s Data Mining, DBMS v/s Data Mining , DM techniques, Mining problems, Issues and Challenges in DM, DM Application areas. Association Rules & Clustering Techniques: Introduction, Various association algorithms like A Priori, Partition, Pincer search.

UNIT -2

Clustering paradigms; Partitioning algorithms like K-means, K-Mediod, CLARA,CLARANS; Hierarchical clustering, DBSCAN, BIRCH, CURE; categorical clustering algorithms, STIRR, ROCK, CACTUS.

UNIT -3

DM techniques & Web Mining: artificial neural networks , application of Neural Network, AI, Fuzzy logic and Genetic algorithm, Decision tree in DM. Web Mining, Web content mining, Web structure Mining, Web Usage Mining.

UNIT-4

Temporal and spatial DM: Temporal association rules, Sequence Mining, GSP, SPADE, SPIRIT, and WUM algorithms, Episode Discovery, Event prediction, Time series analysis. Spatial Mining, Spatial Mining tasks, Spatial clustering, Spatial Trends.

UNIT -5

The vicious cycle of Data mining, data mining methodology, feature extraction, motion analysis, Market baskets analysis, link analysis, generic algorithms, data mining and corporate data warehouse, OLA

Reference Books :

1. Data Mining Techniques ; Arun K.Pujari ; University Press.
2. Data Mining; Adriaans & Zantinge; Pearson education.
3. Mastering Data Mining; Berry Linoff; Wiley.
4. Data Mining; Dunham; Pearson education.

BCA-504E2 Internetwork Application

UNIT - 1

TCP/IP Model: Comparison with ISO -OSI reference model. TCP/IP Protocol Family: Transport : Transmission Control Protocol, TCP Header Format, UDP Routing : IP Addressing , limitations , Brief overview of IPV6 i.e. the next generation IP, IP header format. Network Addresses: ARP, Domain Name System (DNS), RARP.

UNIT-2

User Services /Applications : File Transfer Protocol (FTP) : Channel Connection, Command : internal & Users, Connections, debugging option with FTP, third party transfer, anonymous FTP, FTP Servers, TFTP, Telnet, BOOTP, Gateway Protocols : brief overview of EGP, CGP & IGP, Other protocols : NFS, NIS, RPC, SMTP, SNMP.

UNIT - 3

Internet : Uses, Goals/advantages, WWW, Intranet : Goals, benefits, how TCP/IP, bridges, routers, E-mail works in an intranet, Intranet and WWW : IP Networks, HTTP, Commands, Intranet applications : Overview of Web-Servers : essential & desirable features of a web server : authentication , authorization and encryption ; proxy services ; Subnetting an intranet.

UNIT-4

Overview of an intranet security system: Security and access policies, Server Security, Firewalls, General Security. WAN : overview of DDS, T-1, T-3 , Frame Relay, Sonet, SMDS, ATM Services, WAN implementation, Connecting the LANs : Bridges, routers, Accessing WAN, Message handling system : X.400 & X.500 , Message Transfer Agents (MTA), Mailbox.

UNIT-5

Development of the Socket Programming Interface: Socket Services, Creating a Socket , Binding the Socket , Connecting to the Destination , open Command , Sending Data , Receiving Data , Server Listening , Closing a Connection , Aborting a Connection , UNIX Forks.

Network services- file servers, message servers, Directory servers, print servers, application servers.

Reference Books:

Douglas J. Comer : Internetworking with TCP/IP (Vol I)

Richard Stevens : Unix Networking

BCA-505 E1 NETWORK SECURITY

UNIT-1

A Definition of Computer Security, The Challenges of Computer Security, The OSI Security Architecture. Security Attacks (Passive Attacks, Active Attacks). Security Services (Authentication, Access Control, Data Confidentiality, Data Integrity, Nonrepudiation, Availability Service). Vulnerability and Threats, Malware: Viruses, Worms, Trojan horses.

UNIT-2

Symmetric Encryption Principle (Cryptography, Cryptanalysis) Classical Encryption Techniques, Algorithm Types (Stream Cipher, Block Cipher) Cipher Block Modes of Operation (Electronic Codebook Mode, Cipher Block Chaining Mode, Cipher Feedback Mode, Counter Mode).Symmetric Block Encryption Algorithms (Data Encryption Standard, Triple DES, Advanced Encryption Standard).

UNIT-3

Public-Key Cryptography Principles (Public-Key Encryption Structure, Applications for Public-Key Cryptosystems, Requirements for Public-Key Cryptography). Public-Key Cryptography Algorithms (The RSA Public-Key Encryption Algorithm, Diffie-Hellman Key Exchange).

UNIT-4

Approaches to Message Authentication: MD5 Message Digest Algorithm, The Secure Hash Algorithm (SHA-1), Security of Hash Functions,. Message Authentication Codes (HMAC, MACs Based on Block Ciphers).

UNIT-5

Digital Signatures and Authentication Protocols: Digital Signatures, Authentication Protocols, IP Security, Web Security, Firewalls, Firewall Design Principles, Intrusion Detection Systems, Virtual Private Network.

Reference Books :

1. William Stallings, “Cryptography and Network Security”, Second edition, Prentice Hall, 1999.
2. Atul Kahate, “Cryptography and Network Security,” TMH
3. William Stallings, "Cryptography and Network Security",Third Edition, Pearson Ed
4. Introduction to network security, Krawetz, Cengage

BCA VI SEMESTER

BCA-601 ASP.NET Technology using C#

Unit-I

Overview of ASP.NET framework, Understanding ASP. NET Controls, Applications, Web servers, installation of IIS. Web forms, web form controls server controls, client controls, web forms & HTML, Adding controls to a web form, Buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box, etc. Running a web Applications, creating a multiform web project.

Unit-II

Form Validation: Client side validation, server Side validation, Validation Controls: Required Field, Comparison, Range, Calendar control, Ad rotator Control, Internet Explorer Control. State management- View state, Session state, Application state.

Unit-III

Architecture of ADO.NET, Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class, Data Adapter Class, Dataset Class. Display data on data bound Controls and Data Grid. Database Accessing on web applications: Data Binding concept with web, creating data grid, Binding standard web server controls. Display data on web form using Data bound control.

Unit-IV

Writing datasets to XML, Reading datasets with XML. Web services: Introduction, Remote method call using SOAP, web service description language, building & consuming web service, Web Application deployment.

Unit-V

Overview of C#, C# and .NET, similarities & differences from JAVA, Structure of C# program Language features: Type system, boxing and unboxing, flow controls, classes, interfaces, Serialization, Delegates, Reflection.

Reference Books:

1. VB.NET Black Book by stevenholzner - dreamtech
2. ASP.NET Unleashed
3. C# programming— wrox publication
4. C# programming Black Book by Matt telles

BCA-602 Programming in Python

UNIT-I

Introduction: check icon History, Features, Setting up path, Variable and Data Types, Operator. **Conditional Statements:** if, if-else, if-elif, nested if-else and Looping: for, while, nested loops with break, continue and pass keyword. **String Manipulation:** Accessing Strings, Basic Operations, String slices, Function and Methods. **Functions:** Defining and Calling of a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables.

UNIT-II

Collection: list, tuple , Dictionaries. Introduction, Accessing values, Working, Properties, Functions and Methods. **Modules:** Importing module, Math module, Random module, os module, date-time module, calendar module, Packages, user defined module, introduction of pip. **IO:** Printing on screen and Reading data from keyboard, Opening and closing file, Reading and writing files, Functions.

UNIT-III

Exception Handling: Except, Try, else, finally clause, User Defined Exceptions, raise user- defined exception, nested try-except. **OOPs concept:** Class and object, Attributes, Inheritance, Overloading, Overriding, Data hiding, final and abstract class. Database: Introduction, Connections with MYSQL, Executing queries, Transactions) web-designing: HTML, CSS, JAVASCRIPT.

UNIT-IV

CGI: Introduction, Architecture, CGI environment variable, GET and POST methods. application using CGI: signup, login and session tracking with server side programming.

UNIT-V

DJANGO: working of MVT, Environment setting and installation, creating a Project, Apps Life Cycle, Admin Interface, Views, URL Mapping. **Template System:** DTL and JINJA. Models, Page Redirection, Form Processing, project with signup and login.

References:

1. Programming and Problem Solving with Python (Ashok Namdev Kamthane and Amit Ashok Kamthane) McGraw Hill publication
2. Let Us Python (Kanetkar Yashavant) BPB Publication
3. Python Complete Reference (Brown Martin C.) McGraw Hill publication
4. Python Programming A Modular Approach (Naveen and Kumar and Taneja Sheetal) PEARSON
5. Beginning Django (Rubio Daniel) Apress

DETAILED SCHEDULE
AND SCHEME OF EXAMINATION
OF
BCA FINAL SEMESTER PROJECT WORK

1. Students of BCA final semester are required to undergo 4-5 months Major Project work in the institute/college itself. Principal/Director of the College/institute shall assign the project guide to each enrolled student of BCA Final Semester. The guide in turn, shall allot project title considering the interest and skill of the student. Every student is required to carry out project individually on different topics and project in group will not be considered for evaluation in anycase.
2. The Major Project Work will be carried out in the Institute/college itself, where students are enrolled. It will be the responsibility of the Principal/ Director to assign Guide and Laboratory schedule in the beginning of the semester itself, for all the students. Students will attend college/institute regularly to complete their project work within the period of 4-5 months.
3. Progress reports of project work should be evaluated by concerned guide regularly. A certificate of satisfactory completion and internal evaluation of project work should be attached with Thesis before External Examination.

4. EXAMINATION:

A. Internal Assessment

Only those students will be allowed to appear in external examinations who get satisfactory remark and certificate of approval of their dissertation from the guide. Satisfactory remark will be given to the students on the basis of attendance during the project work, sincerity, regularity, novelty, originality, standard, performance and timely submission of progress reports & dissertation, satisfactory project demonstration and seminar. There will be a seminar and project demonstration of 30 Minutes (maximum) on the project work (Roll no, wise) for a student. The satisfactory remark will be given to those students who will demonstrate and present their work at satisfaction level of the guide and concerned teachers. The following factors should also be taken into considerations at the time of Internal assessment and seminar:

- (i) Suitable Title and nature of work
- (ii) Its importance/relevance
- (iii) Role of the students in the project
- (iv) Basic understanding about the project
- (v) Ability to explain the work carried out in the given time limit. The presentation should be as per the following guidelines:(Student may change the sequence for his/her convenience)
 - Preface
 - Earlier system (if any)
 - Drawback of the earlier system (if any)
 - Concept
 - System Highlights
 - System's strong points (if any)
 - Application area
 - Its use and importance to the company and society (if any)
 - Students Role
 - Any other important things about the system
 - Limitations (if any)

The presentation will be evaluated on considering the following factors:

- Presentation Style
- Communication Skill
- Technical contents
- Relevance
- Ability to handle questions and answers with the participants

B. External Examination:

- (i) After the completion of all the formalities (including internal assessment) Of the project work (as per the schedule) and the certificates in the dissertation must be compulsorily signed by the competent authorities/concerned persons, the Principal/Director of the College/institute will notify the dates of external examination after the consultations of the examiners who are appointed by the University. The Principal/Director will have to notify the students to bring 4 hard bound copies of the project report /dissertation, a CD containing dissertation/project report/power-point presentation (ppt) and project itself (software developed by the student) for live demonstration.
- (ii) The Project report must be submitted in prescribed format and compulsorily comprise of all the 4 certificates (as decided by the board of studies) and properly signed by the concerned persons. The project report/dissertation which will not be in format or not containing prescribed certificates will not be considered for evaluation in any case,
- (iii) After satisfactory internal assessment as prescribed in para 4a, there will be an external examination conducted by the external examiners appointed by the University during the scheduled dates. External examination may comprise the Viva or Seminar, written exam. along-with live demonstration of the project work.
- (iv) The Principal/Director of the College/institute will make proper arrangement of the Computers, Software, LCD Projector etc. for the external examination,
- (v) **The examiners Will have to be necessarily from the field of Computer Science only. It will be the responsibility of the Principal/Director to ensure the eligibility of examiners as per the concerned statute no. 29 of the University.**

**5. FORMAT OF COVER PAGE & CERTIFICATES OF PROJECT REPORT/
DISSERTATION**

i. Format of Cover Page:

A
DISSERTATION
ON
< Name of Project Title/ topic name >
UNDERTAKEN AT
< Name of College/institute>
By
<Name of Student >
SUBMITTED TO
Vikram University, Ujjain

Partial Fulfillment of the Requirements for the Award of the Degree of Bachelor
of Computer Application (B. C. A.)

<submission month & year>

GUIDED By

<Name of Guide>

<Name of the Department >

<Name of the College/institute>

ii. Format of the First Certificate (Certificate of the Principal/Director)

Certificate of the Principal/Director

Reference No. _____

Date:.....

Project Completion Certificate

This is to that Mr. / Ms. <name ofthe student>....., student of BCA (final semester) of < college /institute name >..., has successfully completed the project work entitled” ...< "Title of the Project”> under the guidance of < name of the guide> is a bonafide piece of work carried out at < name ofthe college/institute>.

The project entitled < "Title of the Project"> developed by Mr./Ms. ...<name of the student>.... in the college/Institute and he/she has put at least 200 hours of laboratory work during the tenure of the project with the guide to complete this project. All the prescribed certificates are attached after the completion of all the formalities of the project work as per schedule, including internal examination.

Place:

Signature of Principal (Director)

Date:

Seal of the Institute

iii. Format of the Second Certificate (Certificate of Attendance, duly signed by concerned guide and Principal/Director)

Reference No. _____

Date

Certificate of Attendance

This is to certify that Mr. I Ms. ...<name of the student>..., student of BCA (final semester) of < college /institute name >..., has put at least 200 hours of laboratorywork with the guide to complete this project during the stipulated period of the project at.....< college/institute name >

Signature of Guide

Place:

Signature of Principal (Director)

Date:

Seal of the Institute

iv. Format of the Third Certificate (DECLARATION i.e. Certificate of originality of work duly signed by guide and student)

DECLARATION

I< name of the student> of < name of the college/institute> declare that the dissertation/project report submitted by me under the guidance of < name of the guide> is a bonafide work for the partial fulfillment of the requirement of the BCA final semester project work. I have incorporated all the suggestions provided by my guide time to time.

I further declare that to the best of my knowledge this dissertation contains my original work and does not contain any part of any work which has been submitted for the award of any degree either in this university or in any other university/Deemed university/institute etc. without proper citation and I shall be fully responsible for any plagiarism found at any stage.

Name & Signature of the guide

Name & Signature of the student

v. Format of the Fourth Certificate (APPROVAL i.e. Certificate of approval signed by guide and Principal/Director of the college/institute)

Reference _____ No. Date

Dissertation Approval Certificate

This is to certify that Mr. / Ms. < name of the student>, student of BCA (final semester) of ... < college institute name >..., has successfully completed the project work entitled "<Title of the Project> under my guidance. I have regularly assessed the progress of the work and suggested the correction wherever required.The student has incorporated all the suggestions provided by me in this dissertation. This dissertation is bonafide piece of work of the standard of BCA project work carried out by the student under my supervision. Internal examination has been