

Maharishi University of Management & Technology, Bilaspur (Chhattisgarh)



**DEPARTMENT OF COMPUTER SCIENCE &
INFORMATION TECHNOLOGY (CSIT)**

SYLLABUS

(B.C.A)

2020-2021

MAHARISHI UNIVERSITY OF MANAGEMENT & TECHNOLOGY,

MANGLA, BILASPUR (C.G.)
Syllabus: BCA

S.No.	Paper Code	Paper No.	Name of the Paper	Marks
Semester – I				
1.	BCA101	I	Foundation Hindi	100
2.	BCA102	II	Foundation English	100
3.	BCA103	III	Computer Fundamental	100
4.	BCA104	IV	Discrete Mathematics	100
5.	BCA105	V	PC Software Package	100
6.	BCA106	VI	Environment Science	100
7.	BCA107	VII	Maharishi Vedic Science-I	100
8.	BCA108	VIII	Practical Computer Fundamental	100
9.	BCA109	IX	Practical Pc software	100
Semester – II				
8.	BCA110	I	Programming Methodology and C Programming	100
9.	BCA111	II	Operating System	100
10.	BCA112	III	Concept of Software	100
11.	BCA113	LAB: I	Lab of Programming in “C”	100
12.	BCA114	LAB: II	Lab of Software Packages	100
Semester – III				
13.	BCA115	I	Foundation Hindi-II	100
14.	BCA116	II	Foundation English-II	100
15.	BCA117	III	Digital Electronics and Microprocessor	
16.	BCA117	IV	Computer Networks	100
17.	BCA118	V	Data Structure	100
18.	BCA119	VI	Basic Mathematics (Bridge Course)	100
Semester – IV				
19.	BCA120	I	Object Oriented Programming Using C++]	100
20.	BCA121	II	Computer Graphics and Multimedia	100
21.	BCA122	III	Computer Organization and Architecture]	100
22.	BCA123	LAB: I	Programming Lab Using C++]	100
23.	BCA124	LAB: II	Multimedia Lab	100
Semester – V				
24.	BCA125	I	Foundation Hindi-III	100
25.	BCA126	II	Foundation English-III	100
26.	BCA127	III	Numerical Analysis	100
27.	BCA128	IV	Software Engineering and Project Management	100
28.	BCA129	V	Database Design and RDBMS	100
29.	BCA130	VI	Introduction to AI and Expert System	100
Semester – VI				
30.	BCA131	I	Net Technology	100
31.	BCA132	II	Data Mining and Warehousing	100
32.	BCA133	III	Current Trends and Technology in Computer Science	100
33.	BCA134	IV	Maharishi Vedic Science-II	100
34.	BCA135	Lab 1	Practical based on .NET Technology	100
35.	BCA136	VI	Project: Major Project	100

Bachelor of Computer Application (Semester I to VI)

SYLLABUS SEMESTER - I

विषय सामान्य हिन्दी

प्रथम सत्र (सेमेस्टर)

विषय कोड **BCA101** :अनिवार्य प्रश्न पत्र

बी.एससी./बी.सी.ए.

इकाई – 1 (क) पल्लवन परिभाषिक शब्दावली।

(ख) ईदगाह (कहानी) – मुंशी प्रेमचंद

इकाई – 2 (क) पत्र लेखन (निजी पत्र, व्यावहारिक पत्र, शासकीय पत्र, अर्द्धशासकीय पत्र आवेदन पत्र)

(ख) भारत वंदना (कविता) – सूर्यकांत त्रिपाठी निराला

इकाई – 3 (क) पर्यावाची, युग्म शब्द, शब्द शुद्धि, उपसर्ग, प्रत्यय, तत्सम, तदभव, महावरे–लोकोक्ति।

(ख) भोलाराम का जीव (व्यंग) – हरिशंकर परसाई

इकाई – 4 देवनागरी लिपि एवं वर्तनी का मानक रूप, कम्प्यूटर में हिन्दी का अनुप्रयोग।

इकाई – 5 हिन्दी अपठित संक्षेपण।

सहायक पुस्तकें –

- | | | |
|------------------------------|---|---|
| 1. भारतीया के अमर स्वर | – | डॉ. धनंजय वर्मा |
| 2. प्रयोजनमूलक हिन्दी | – | विनोद गोदरे |
| 3. कम्प्यूटर भाषिक अनुप्रयोग | – | विजय कुमार मल्होत्रा |
| 4. हिन्दी संक्षिप्त लेखन | – | रामप्रसाद किचलू |
| 5. हिन्दी शब्द सामर्थ्य | – | शिवनारायण चतुर्वेदी |
| 6. हिन्दी व्याकरण एवं रचना | – | म.प्र. हिन्दी ग्रंथ अकादमी भोपाल प्र.सं. 2013 |

B.C.A. - I Semester**Foundation Course**

Session 2020-21

Class B.Sc./B.C.A

English Language

Paper Code BCA102

UNIT - I TEN QUESTIONS TO BE SET (ONE FROM EACH CHAPTER) AND FIVE TO BE ATTEMPTED**LESSION** 1. Where the Mind is without Fear - Rabindranath Tagore

2. The Ideals of Indian Art - K. Bharatha Iyer
3. The Wonder that was India - A.L. Basham
4. The Heritage of Indian Art - Kapila Vatsyayan
5. Life in Vedic Literature - Krishna Chaitany
6. The Ramayana and the Mahabharata
7. Freedom Movement in India - Sudhir Chandra

UNIT - II COMPREHENSION - Unseen Passage**UNIT - III** i. COMPOSITION - PARAGRAPH WRITING

(Four to be set one to be attempted)

ii. Letter Writing - With internal choice (One formal & one Informal)

UNIT - IV LANGUAGE SKILLS

Vocabulary

- A. Synonyms, Antonyms
- B. Prefix and Suffix
- C. Match the Column
- D. Make Sentences etc

UNIT - V GRAMMAR AND LANGUAGE SKILLS BASED ON TEXT BOOK.

The Tense forms, Determiners and Countable/ Uncountable Nouns, Verb, Articles, Conditional Sentences, modals (25 to be set and 20 to be attempted)

Books :
- English Language and Indian Culture
- Madhya Pradesh Hindi Granth Academy**Note :** There will be two internal tests and one project/ seminar of 20 marks each out of these best of two will be considered for the results.

Computer Application
Paper Code : BCA103
Paper: III – Computer Fundamental

Unit-I : Basics of Computer

Brief History of Computers, Technical Evolution of Computers, Computer Pioneers, Categories/Types of Computers, Computer Hardware, Computer Software, CPU and its components; Mother board, Microprocessor, Expansion slots, Input/output Ports, Memory; Types of Computer Memory, Memory modules viz. SIMM, DIMM, EDO, RDRAM, SDRAM, DDRAM, etc

Unit-II: Input, Hard/Soft copy Devices, Storage Devices:

Input Concepts, Input Devices viz. Keyboard, Mouse, Joystick, Track Ball, Touch Screen, Light pen, MICR, OMR, OBR, OCR, Voice Input, Smart Cards, Bar Code readers, Digitizer, Scanner, etc. Graphic Display Devices: DVST, Graphical input devices, three dimensional input devices; Voice output systems. Hard copy Devices viz. Printer, Types of printers, Features of printers; Plotter, Types of plotters, Features of plotters; Soft copy devices viz VDU and it's types, Types of Cards (brief) viz. CGA, MGA/MDA, EGA, VGA, SVGA, etc. Storage devices viz. Fixed Disk or Hard Disk, Floppy Diskette, Data Retrieval and Characteristics; Optical Technology; CD-ROM, CD-ROM operation, CD-ROM standards, Origins of CD-ROM; Hard Disk Drive, Floppy disk drive, CD-Drive, DVD-Drive, Tape drive, Zip drive,, Pen drive, etc.

Unit – III: Operating Systems and MS-DOS:

Custom made software, Pre-written software, Computer processing techniques, Functions of operating system (only list), Compiler, Assembler, Interpreter, Debugger, Loader, and Linker; Machine language, Assembly language, High level languages, Fourth generation languages; Booting process(with BIOS & POST), Auto executing programs, Setting parameters of config.sys; Internal and External commands of MS-DOS along with their syntax and different options.

Unit-IV: Program Planning & Computer Languages:

Planning the computer program: algorithm, representation of algorithms, flowchart, flowchart symbols, advantages and limitations of flowchart, Pseudocode: definition, pseudocodes for basic control structures, advantages and limitations of pseudocode. Introduction and evolution of programming language, Types of programming language, characteristics of a good programming language, programming paradigms: procedural oriented and object oriented programming

Unit – V: Internet & Application:

Internet: Definition, history of internet, basic services of internet, uses of internet, internet search engine; Internet security: firewall, encryption. Application of IT, Latest IT trends: Artificial intelligence, Data mining, Cloud computing, Big Data.

Text Books

1. "Computer Fundamentals", P.K. Sinha, BPB Publication
2. Fundamental of Computers, Raja Raman V., Prentice Hall of India, New Delhi.
3. Introduction to Computers, Norton, Peter, , Mc-Graw-Hill.
4. Computer Fundamentals, B. Ram, New Age International Pvt. Ltd.

Reference Books:

1. A+ Certification All-in-One Desk Reference for Dummies, Glen Clarke
2. IBM PC & Clones: Hardware Trouble Shooting and Maintenance, B. Govindarajalu, Tata McGraw Hill
3. Pc Upgrade & Repair Bible , Wiley India.

B.C.A. - I Semester
Computer Application
Paper Code : BCA104
[Paper: IV- Discrete Mathematics]

Unit-I

Recall of statements and logical connectives, tautologies and contradictions, logical equivalence, algebra of propositions quantifiers, existential quantifiers and universal quantifiers.

Unit -II

Boolean algebra and its properties, algebra of propositions as an example, De Morgan's Laws, partial order relations G.L.B., L.U.B. Algebra of electric circuits and its applications. Design of simple automatic control system.

Unit-III

Boolean functions - disjunctive and conjugative normal forms. Boolean's expansion theorem, fundamental forms. Many terminal Networks.

Unit -IV

Arbitrary Cartesian product of sets. Equivalence relations, partition of sets, injective, surjective, bijective maps, binary operations, countable, uncountable sets.

Unit-V

Basic Concept of Graph Theory, Sub graphs, Trees and their properties, Binary Trees, Spanning Trees, Directed Trees, Planar graphs, Euler Circuit, Hamiltonian Graph. Chromatic number.

Text Books:

1. Boolean Algebra and Its Applications, J. Eldon Whitesitt, Addison-Wesley.
2. A Textbook of Discrete Mathematics, Swapan Kumar Sarkar, S. Chand.
3. Discrete Math with Proof, Eric Gossett, Pearson.
4. Discrete Math Workbook: Interactive Exercises, James R Bush, Pearson.

Reference Books:

1. Discrete Mathematics, Prof. H K Pathak, Shiksha Sahitya Prakashan
2. Discrete Maths, C.L.Liu, T McGraw Hill

B.C.A. - I Semester
Computer Application
Paper Code : BCA105
[Paper: V – PC Software Package]

Unit-I : WINDOWS

Installing WINDOWS, Basic Elements of WINDOWS, My Computer, Sharing Devices. Windows Explorer (Files and Folder Operations), Accessories like Accessibility, Entertainment, Communication, System Tools, Paint Brush, Calculator, Calendar, Clock, Note Pad, Word Pad Etc., Control Panel, Changing Color and Theme, Changing the Desktop Background, Screen Saver, Adjusting Display Settings, Adjusting Sound, Adjusting the Mouse, Changing the Date and Time, Changing Language and Region Options, Customizing Folder View Options, Connecting to the Internet: Dial-Up Connections, Broadband Connections, Installing New Hardware & Printer, Installing & Removing Software, Power Settings.

Unit- II : Introduction to MS Word

Menus, Shortcuts, Document types; Working with Documents: Opening Files - New & Existing, Saving Files, Formatting page and Setting Margins, Converting files to different formats- Importing, Exporting, Sending files to others, Editing text documents- Inserting, Deleting, Cut, Copy, paste, Undo, Redo, Find, Search, Replace, Using Tool bars, Ruler- Using Icons, Using help; Formatting Documents: Setting Font Styles, Setting Paragraph style, Setting Page Style, Setting Document Styles, Creating Tables, Drawing, Tools, Printing Documents, Mail Merge.

Unit-III : Introduction to MS Power Point

Creating new Presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts, Formatting a presentation-Adding style, Color, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout, Inserting pictures, movies, tables etc. into the presentation, Drawing Pictures using Draw, Setting Animation & transition effect, Adding audio and video, Printing Handouts. Generating standalone presentation viewer.

Unit-IV : Introduction to MS Excel

Introduction: Spreadsheet & its Applications, Opening spreadsheet, Menus & Toolbars & icons, Shortcuts, Working with Spreadsheets-Opening, Saving Files, Setting Margins, Converting files to different formats- Importing, Exporting and Sending files to others. Entering and Editing Data, Computing data: Formula. Formatting Spreadsheets- Cell, row, column & Sheet, Alignment, Font, Border & shading. Highlighting values, Hiding/Locking Cells: Worksheet- Sheet Name, Row & Column Headers, Row Height, Column Width and Worksheet Sheet Formatting & style background, Graphs, Printing worksheet.

Unit-V : Introduction MS Access

Database concepts Tables, Queries, Forms, Reports, Opening & Saving database files: Creating Tables, Table Design, Indexing, Entering data, Importing data, Creating Queries: SQL statements, Setting relationship, Creating Forms: GUI, Form, Creating & printing reports.

Text Books:

1. Comdex Computer Course Kit (windows 7 with office 2010), Gupta Vikas. Dreamtech Publication
2. Mastering MS Office 2000, Professional Edition by Courier, BPB Publication
3. MS Office 2000 Training Guide by Maria, BPB Publications
4. MS Office complete by SYBEX.

B.C.A. - II Semester

Foundation Course

English Language

Syllabus
Session 2020-21
Class B.Sc./B.C.A

SEMESTER - II**UNIT - I TEN QUESTIONS TO BE SET (ONE FROM EACH CHAPTER) AND FIVE TO BE ATTEMPTED**

- LESSION**
1. Dandi Salt March - Louis Fischer
 2. Aspects of Indian Constitution - M.C. Chagla
 3. Individual Freedom - Jawaharlal Nehru
 4. Fundamental Duties
 5. Delhi in 1857 - Mirza Ghalib
 6. Raja's Diamond - R.L. Stevenson
 7. Tree - Tina Morris

UNIT - II COMPREHENSION - Unseen Passage**UNIT - III** PRECJS WRITING**UNIT - IV** ESSAY WRITING

At least : Four to be set and one to be attempted.

UNIT - V **A.** Grammar and Language Skills Based on Text Book
Articles, prepositions, gerunds, possessives, combined the sentences,
narration, voice (Active & Passive) - 25 to be set and 20 to be attempted.

B. Vocabulary from the text. At least 15 to be set 10 to be attempted
(Synonyms, antonyms, match the column)

Books : English Language and Indian Culture
- Madhya Pradesh Hindi Granth Academy

Note : There will be two internal tests and one project/ seminar of 20 marks each out of these best of two will be considered for the results.

सामान्य हिन्दी
द्वितीय सत्र (सेमेस्टर)
अनिवार्य प्रश्न पत्र
विषय कोड **BCA108** :अनिवार्य प्रश्न पत्र
बी.एस.सी./बी.सी.ए.

इकाई – 1 निबंध–

महात्मा गांधी	–	सत्य और अहिंसा
विनोबा भावे	–	ग्राम सेवा
आचार्य नरेन्द्र देव	–	युवकों का समाज में स्थान

इकाई – 2 निबंध –

वासुदेवशरण अग्रवाल	–	मातृभूमि
भागवतशरण उपाध्याय	–	हिमालय की व्युत्पत्ति
हरि ठाकुर	–	डॉ. खूबचंद बघेल

इकाई – 3 हिन्दी भाषा और उसके विविध रूप–

सर्वजनात्मक भाषा, संचार भाषा, राजभाषा, माध्यम भाषा, मातृभाषा, कार्यालयीन भाषा, मीडिया की भाषा, वित्त एवं वाणिज्य की भाषा, तकनीकी भाषा।

इकाई – 4 अनुवाद

अनुवाद का स्वरूप, परिभाषा, क्षेत्र, प्रक्रिया। हिन्दी की प्रयोजनीयता में अनुवाद की भूमिका। व्यावहारिक अनुवाद अभ्यास।

इकाई – 5 समाचार लेखन (रिपोर्टिंग)

समाचार के प्रकार, समाचार–लेखन के महत्वपूर्ण अंग, समाचारों के उदाहरणों के अभ्यास।

सहायक पुस्तकें :-

- | | | |
|--------------------------------------|---|--------------------------|
| 1. हिन्दी भाषा और संस्कृति | – | सं. डॉ. राजेन्द्र मिश्रा |
| 2. प्रयोगात्मक और प्रयोजनमूलक हिन्दी | – | डॉ. दिनेशगुप्ता |
| 3. अनुवाद कला | – | डॉ. एन.इ. विश्वनाथ अययर |
| 4. हिन्दी भाषा | – | महावीर प्रसाद द्विवेदी |
| 5. बोलचाल की हिन्दी और संचार | – | मधु धवन |

Foundation Course

Syllabus
English Language
Paper Code BCA109
Session 2020-21
Class B.Sc./B.C.A

SEMESTER - II**UNIT - I TEN QUESTIONS TO BE SET (ONE FROM EACH CHAPTER) AND FIVE TO BE ATTEMPTED**

- LESSION**
1. Dandi Salt March - Louis Fischer
 2. Aspects of Indian Constitution - M.C. Chagla
 3. Individual Freedom - Jawaharlal Nehru
 4. Fundamental Duties
 5. Delhi in 1857 - Mirza Ghalib
 6. Raja's Diamond - R.L. Stevenson
 7. Tree - Tina Morris

UNIT - II COMPREHENSION - Unseen Passage**UNIT - III** PRECJS WRITING**UNIT - IV** ESSAY WRITING

At least : Four to be set and one to be attempted.

UNIT - V **A.** Grammar and Language Skills Based on Text Book
 Articles, prepositions, gerunds, possessives, combined the sentences,
 narration, voice (Active & Passive) - 25 to be set and 20 to be attempted.

B. Vocabulary from the text. At least 15 to be set 10 to be attempted
 (Synonyms, antonyms, match the column)

Books : English Language and Indian Culture
 - Madhya Pradesh Hindi Granth Academy

Note : There will be two internal tests and one project/ seminar of 20 marks each out of these best of two will be considered for the results.

Computer Application

Paper Code : BCA110

[Paper: III – Programming Methodology and C Programming]

Unit – I : C Programming Concepts

History of C language, C Language Character set. Tokens, Constant, Keywords and Identifiers, Variables Data Types Declaration and Assignment of Variables, Defining Symbolic Constants, Operators and Expressions: Types of Operators- Arithmetic, Relational and Logical Operators, Assignment and Conditional Operators Increment & Decrement Operators, Bitwise and Special Operators, Arithmetic Expression and its evaluation, Hierarchy of Arithmetic Operations- Evaluations, Precedence and Associativity- Mathematical Functions, Library functions: Getchar (), putchar (), printf (), scanf (), puts (), gets ().

Unit-II : Control and Branch Handling

Flow of control - if, if-else, while, do-while, for loop, Nested control structures - Switch, break and continue go to statements, Comma operator, The ? : Operators, Functions -Definition - prototypes - Passing arguments - Recursion- Storage Classes - Automatic, External, Static, Register Variables, Storage Classes and Character Strings: Automatic, Register, Static, External (Local and Global), Scope rules.

Unit - III : Arrays, String, Structures and Unions in C

Arrays - Defining and Processing, Single, Two Dimensional and Multi-dimensional arrays. Passing arrays to functions, Arrays and Strings, Handling of Character Set: Declaration & Initialization of String Variables, Structures and Unions: Definitions, Initialization and Assigning Values to Members, Arrays of Structures and Arrays Within Structures, Structure with in Structure, Unions- Size of Structures.

Unit-IV : Functions and Pointers

User Defined Functions: Form of "C" functions- Calling a Function - Nesting of Functions - Recursion - Functions with Arrays, Pointers: Declaration and Initialisation of Pointers, Pointer Expression, Operation on Pointers, Pointer and Arrays, Arrays of Pointers, Pointer and Character Strings, Pointers and Functions, Pointers and Structures, Pointer on Pointers.

Unit-V : File Maintenance in C

File Input/Output: Introduction, Defining, Opening and closing a file, Study of file I/O Operations: fopen (), fclose() , fputs () , fgets () , fread () , fwriteQ, Input / Output Operations on a file, Random access to file, Command line arguments, Time, Date and Localization Functions, Dynamic Allocation Functions, Utility Functions, Wide-Character Functions.

Text books:

1. LET US C, Yashwant Kanetkar, BPB PUBLICATIONS
2. The Complete Reference C, Herbert Schildt, Tata McGraw HILL
3. PROGRAMMING IN ANSI C - by E. Balgurusamy - Tata McGraw HILL
4. PROGRAMMINGWITH C. Byron Govtfred, Tata McGraw HILL

Reference Books:

1. The "C" Programming Language, Briain W. Kenigham & Dennis Ritchie, Pearson
2. The Spirit of "C"- Henry Mulish, Herbert L. Cooper.
3. Mastering "C" - Crain Bolon.

B.C.A. - II Semester
Computer Application
Paper Code : BCA111
[Paper: IV – Operating System]

Unit - I: Introduction to Operating System

What is an Operating System, Operating Systems Architecture, Operating Systems as an Extended Machine & Resource Manager, Process Model, Process States and Transitions, Types of System Calls, System Boot, Multi-Programming, Multi-Tasking, Multi-Threading; Operating Systems Classification: Simple Batch Systems, Multi-programmed Batches systems, Time-Sharing Systems, Parallel & Distributed Operating Systems.

Unit –II: Process Management

Processes: Process Scheduling, Cooperating Processes, Inter-process Communication, Threads, CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple- Processor Scheduling, Process Synchronization: Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors, Deadlocks: Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Recovery from Deadlock, Combined Approach to Deadlock Handling.

Unit-III: Memory Management

Main Memory Management: Background, Logical versus Physical Address space, swapping, Contiguous allocation, Paging, Segmentation, Segmentation with Paging, Virtual Memory: Demand Paging, Page Replacement, Page replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Demand Segmentation.

Unit-IV: Device and Storage Management

File-System Interface, Mass-Storage Structure, Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Buffering, Multiple Paths, Secondary-Storage Structure: Disk Structure, Disk Scheduling, Disk Management.

Unit-V: File-System Implementation

A Simple File System, Logical & Physical File System, File-System Interface: Access Methods, Directory Structure, Protection, Free-Space Management, Directory Implementation.

Text Books:

1. Operating System Concepts, Silberschatz and Galvin, Pearson Education Pub.
2. Operating Systems, Madnick E., Donovan J., Tata McGraw Hill,
3. Operating Systems, A. S. Tannenbaum, PHI

Reference Books:

1. Operating Systems Internals and Design Principle, William Stallings, Prentice Hall Publishers
2. Operating Systems- A Concept-Based Approach, Dhananjay M. Dhamdhare, McGraw-Hill

Computer Application
Paper Code : BCA112
[Paper: V – Concept of Software]

Unit-I : Category of Software with example and brief features

Introduction to Software (s/w), Types of s/w: Application Software & System Software, Various Application Software s/w and their examples: Word Processing s/w, Spreadsheet s/w, Database s/w, Presentation s/w, Business s/w Suite, Project Management s/w, Personal Information Manager s/w, Business s/w for Phones, Accounting s/w, Document Management s/w, Enterprise Computing s/w; Graphics and Multimedia s/w, Computer-Aided Design s/w, Desktop Publishing s/w, Image Editing s/w, Video and Audio Editing s/w, Multimedia Authoring s/w, Web Page Authoring s/w; Software for Home, Personal, and Educational Use: Personal Finance s/w, Legal s/w, Tax Preparation s/w, Home Design/Landscaping s/w, Travel and Mapping s/w, Reference and Educational s/w, Entertainment s/w, Web Applications s/w, Application Software for Communications.

Unit- II : System Software

System Programming and System Programs, Needs of System Software, BIOS, POST sequence, Concept & introduction to various system s/w such as: Assemblers, Loaders, linkers, macro processors, Macros, Compilers, Interpreters, Operating system and formula system, Translators and its types, Editor, Simulator, Emulator, Debugger, Device Drivers, Firmware.

Unit-III : Assemblers and Macro processors

Assemblers: Structure of assembler, Overview of the assembly process, Basic function, Machine dependent and machine independent features of assembler, Types of assemblers - single pass, multi-pass, cross assembler, Macros & Macro processors: Macro definition and examples, Basic Macro Processor Functions, Machine Independent Macro Processor Features, Concept of Parameterized Macro, Nested Macros, Conditional Macro Expansion, Recursive Macro. Symbolic debugger.

Unit – IV : Loaders and Linkage Editors

Basic Loader Functions, Linking and Concept of Static & Dynamic Relocation, Various loader schemes with their advantages and disadvantages, Other loader schemes - binders, Linking loaders, Dynamic binders, Machine dependent & Machine Independent Loader Features, Interpreters: use of interpreter, pure and impure interpreter.

Unit-V Compilers

Introduction to Compilers, Phases of a Compiler, Comparison of Compilers & Interpreters, Machine dependent & Machine Independent Compiler Features, Aspects of Compilation, Lexical Analysis, Syntax Analysis, Memory Allocation, Compilation of Expressions; Code optimization - local and global optimization, Study of LEX & YACC.

Text Books:

1. System Programming- J. J. Donovan, Tata McGraw-Hill Education.
2. System Programming and Operating systems- D. M. Dhamdhare, Tata McGraw-Hill
3. System Software: An introduction to systems programming- Leland L. Beck, Pearson Education
4. Principles of Compiler Design-Aho and Ullman, Pearson Education.

Reference Books:

1. Compiling Techniques, J P Bennett, TMH .
2. Modern Compiler Design, Dick Grune, Koen G.L, Henri Bal, Wiley India.
3. Compiler Construction, Principles and Practice, Kenneth C. Louden; Cengage Learning

B.C.A. - II Semester
Computer Application
Paper Code : BCA114
[LAB: I – Lab of Programming in “C”]

- 1) If a five digit number is input through the keyboard, write a program to reverse the number, print the sum and product of digit.
- 2) WAP to interchange the content of two variable (swapping).
- 3) WAP to convert and print the distance in meter, feet, inches and centimeter if distance is input through the keyboard.
- 4) WAP a to check whether a year entered through keyboard is a leap year or not.
- 5) WAP to check whether a number is even or odd.
- 6) WAP to determine whether entered character is a capital or small or digit or special symbol.
- 7) WAP to find the factorial value of any number entered through keyboard.
- 8) WAP to compute the sum of the first n terms of the following series
 $S = 1 + 1/2 + 1/3 + 1/4 + \dots$
- 9) WAP to compute the sum of the first n terms of the following series
 $S = 1 - 2 + 3 - 4 + 5 - \dots$
- 10) WAP to print all prime numbers from 1 to 100.
- 11) WAP to print a triangle of stars as follows (take number of lines from user):


```
*
***
*****
*****
*****
```
- 12) Write a menu driven program using switch which has following option:
 - I) Factorial of number
 - II) Prime or Not
 - III) Odd or Even
- 13) Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.
- 14) Write a function to implement question number one (1) to seven (7) in above list.
- 15) WAP to perform following operations on strings:
 - a) Concatenate two strings.
 - b) Compare two strings
 - c) Calculate length of the string
 - d) Convert all lowercase characters to uppercase
 - e) Convert all uppercase characters to lowercase
 - f) Calculate number of vowels
 - g) Reverse the string
- 16) Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Initialize the structure and print the initialized value on screen.
- 17) WAP to explain pointer arithmetic.
- 18) WAP to explain the concept of call by value and call by address mechanism.
- 19) WAP to read Content of file and print them on screen.
- 20) WAP to copy content of one file into another.
- 21) WAP to explain following function-
fopen (), fclose (), fputs (), fgets (), fread (), fwrite ()

B.C.A. - II Semester

Computer Application

Paper Code : **BCA115****[LAB: II –Lab of Software Packages]****Section-A**

WINDOWS : Basic Elements of WINDOWS, My Computer, Sharing Devices, Windows Explorer, Accessories: Entertainment, Communication, System Tools, Paint Brush, Calculator, Calendar, Clock, Note Pad, Word Pad Etc., Control Panel, Changing Color and Theme, Changing the Desktop Background, Screen Saver, Adjusting Display Settings, Adjusting Sound, Adjusting the Mouse, Changing the Date and Time.

Section-B

Introduction to MS Word: Menus, Shortcuts, Document types; Working with Documents: Opening Files - New & Existing, Saving Files, Formatting page and Setting Margins, Converting files to different formats- Importing, Exporting, Sending files to others, Editing text documents- Inserting, Deleting, Cut, Copy, paste, Undo, Redo, Find, Search, Replace, Using Tool bars, Ruler- Using Icons, Using help; Formatting Documents: Setting Font Styles, Setting Paragraph style, Setting Page Style, Setting Document Styles, Creating Tables, Drawing, Tools, Printing Documents.

Section-C

Introduction to MS Power Point: Opening new Presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts, Creating a presentation, Formatting a presentation-Adding style, Color, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout, Inserting pictures, movies, tables.

Section-D

Introduction to MS Excel: Introduction: Spreadsheet & its Applications, Opening spreadsheet, Menus & Toolbars & icons, Shortcuts, Working with Spreadsheets-Opening a File, Saving Files, Setting Margins, Converting files to different formats- Importing, Exporting ar^Sending files to others, Spreadsheet addressing, Entering and Editing Data, Computing data- Setting Formula, Finding total in a column or row, Mathematical operations, Formulas, Formatting Spreadsheets & Printing worksheet.

Section-E:

Introduction MS Access: Database concepts: Tables, Queries, Forms, Reports, Opening & Saving database files: Creating Tables, Table Design, Indexing, Entering data, Importing data, Creating Queries: SQL statements, Setting relationship, Creating Forms: GUI, Form, Creating & printing reports.

B.C.A. - III Semester

Computer Application

Paper Code : **BCA116****[Paper: I – Digital Electronics and Microprocessor]****Unit – I: Background of Digital Electronics**

Digital Signals, Different Type of Numbering System: Decimal, Octal, Binary, Hexadecimal, Conversion from One Number System to Another System, Binary Addition, Binary Subtraction, Binary Complements. One's & Two's Complement, Binary Subtraction Using Two's Complement.

Unit – II: Logic Families

Logic Gate Basics: Or gate AND Gate, NOT Gate, Exclusive-OR (XOR) Gate, Truth Tables for Logic Gates, Truth Tables for Combinational Logic.

Types of Logic Family: Circuit of RTL, DTL, TTL and Working Function as a Gate, Emitter Coupled Logic (ECL) CMOS Logic Family, NMOS and PMOS Logic, Comparison of Different Logic Families.

Unit – III: Boolean Algebra and Karnaugh Maps

Boolean Algebra, Boolean Expression Of Combinational Logic, Laws of Boolean Algebra, Rule a of Boolean Algebra: NOT Rule, OR Rules, AND Rules, XOR Rules, Derivation of other rules Simplification, Demorgan's Theorem, Boolean Expression Formats: Sum-Of- Product, Product-Of-Sum, Converting SOP & POS to Truth Table & Truth Table to Expression, Karnaugh Maps.

Unit – IV: Combinational and Sequential Circuit

Decoders, Multiplexers, De-Multiplexers, State Machine Design Process: Mealy Versus Moore State Machines, S-R Latch/ Flip-Flop, D Latch, J-K Flip-Flop, Divide-By-Two Circuit, Registers, Counter Ripple (Asynchronous) Counter and Synchronous Counter, UP/DOWN Counters,

Unit – V: Microprocessor

Generic Architecture of Microprocessor, Pin Diagram & Pin Function of Intel 8085 Microprocessor, Instructions Set for Microprocessor, Definition and need of Addressing Mode, Addressing Modes of Intel 8085 & 8086 Microprocessor, Machine Cycle and Instruction Cycle of Microprocessor, Working of Microprocessor.

Text book:

1. Modern Digital Electronics, R. P. Jain, TMH
2. Digital Principles & Application, Leach & Malvino, TMH
3. Digital Logic Design, Morris Mano, PHI
4. Microprocessor – Architecture, Programming and Applications with the 8085, Ramesh S. Gaonkar

Reference Books:

1. Digital Integrated Electronics, H. taub & D. Shilling, McGraw Hill
2. Digital Principles & Design, Givone, TMH
3. Digital Circuits & Design, S. Aligahanan, S. Aribazhangan, Bikas Publishing House.
4. Fundamental of Digital Electronics & Microprocessor, Anokh Singh, A. K. Chhabra, S. Chand

B.C.A. - III Semester
Computer Application
Paper Code : BCA117
[Paper:II – Computer Networks]

Unit – I: Introduction to Computer Network

Computer Network Fundamental and types of Computer Network LAN, MAN, WAN, Transmission Media, Transmission modes, Line Configuration, Wireless and Wired Network Broadcast and Point to Point Network, Network Topologies, ISO-OSI Reference Model, TCP/IP Model.

Unit – II: Data Link Layer

Functions at Data Link Layer, Framing and Correction Codes: Checksum, CRC, Hamming Code, Flow Control: Stop & Wait and Sliding Window Protocols, Data Link Protocols: HDLC and PPP, Medium Access Sub-Layer, LLC Protocol, IEEE Overview of IEEE 802.2, 802.3, 802.5 802.6.

Unit – III: Network Layer and Transport Layer

Functions of Network Layer, Networking & Internetworking Devices, Routing Protocols & Algorithms, Principles of Congestion Control, Ipv4 Address, Ipv4 Addressing, Ipv6 Address, Functions of Transport Layer, Flow Control & Buffering, Introduction To TCP/UDP Protocols and their Comparison.

Unit – IV: Common Network Architecture

Connection Oriented & Connectionless N/Ws, Frame Relay, Example of N/Ws-P2p, X.25, ATM Ethernet, Wireless LANS – 802.11, 802.11x, Gigabit, Broad Band Networks: Integrated Service Digital Networks (ISDN), Broad Band ISDN, ATM, Very Small Aperture Terminal (VSAT).

Unit – V: Internet and Protocols

World Wide Web (WWW), Domain Name System (DNS), E-Mail, File Transfer Protocol (FTP), Hyper Text Transfer Protocol (HTTP), E-Mail Protocols: Mime & SMTP, POP, IMAP, Telnet – Remote Communication Protocol, Proxy Server, Proxy Web Servers, Working Of Internet Applications.

Text books:

1. Computer Networks, Andrew S. Tanenbaum, PHI / Pearson Education Inc.
2. Data communication and Networking, Behrouz A. Forouzan, Tata McGraw-Hill.
3. Internet Law-Text and Materials, Chris Reed, Universal Law Publishing Co., New Delhi

Reference book:

1. Data and computer communication, William Stallings, Pearson Education.
2. Computer and communication networks, Nader F. Mir, Pearson Education, 2007.
3. Data & computer communication, Black, PHI.

B.C.A. - III Semester
Computer Application
Paper Code : BCA118
[Paper:III –Data Structure]

Unit-I : Introduction and Array

Data Types, Data Structure and its Classification, Arrays: Array concept (one dimension, two dimension), Operations for one dimension array (insertion, deletion, traversal), Examples.

Unit-II : Linked Lists

Concept of a linked list, Circular & Doubly linked list, Operations on linked lists, List Manipulation with Pointers, Insertion & Deletion of elements, Applications of linked lists.

Unit-III : Stacks-Queues and Binary Tree

Definitions and Structure, Representation using Array & Linked List, Application of Stack and Queues, Postfix and Prefix Conversion, Evolution of Arithmetic Expressions, Binary Trees: Definition, Memory Representation, Trees traversal algorithms (recursive and non-recursive), threaded trees, BFS, DFS.

Unit-IV : Searching and Sorting

Linear and Binary Search Algorithms, Complexity, Binary Search Trees (construction, insertion, deletion & search), Sorting Algorithms: Bubble Sort, Insertion Sort, Selection Sort, Tree sort, Heap Sort, Quick Sort, Merge Sort & Radix sort, External Sorting.

Unit-V : Analysis of Algorithm

Time and Space Complexity of Algorithms, Average Case & Worst Case Analysis, Asymptotic Notation, Big O notations, Analysis of sorting algorithms -Selection sort, Bubble sort, Insertion sort, Heap sort, Quick sort and Analysis of searching algorithms -Linear Search & Binary Search.

Text Book:

1. Data Structures using C, A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.
2. Data Structures using C by A. K. Sharma, Pearson Education
3. Data Structures and Algorithms, A.V. Aho, J.E Hopcroft and T.D. Ullman, Addison- Wesley, Low Priced Edition.
4. Fundamentals of Data structures, Ellis Horowitz & Sartaj Sahni, AW Pub.
5. Fundamentals of computer algorithms, Horowitz Sahni and Rajasekaran, Pearson Edu.
6. Data Structures and Program Design in C, Robert Kruse, PHI of Data Structures, Jr. Seymour Lipschetz, Schaum's outline by TMH.

B.C.A. - III Semester
Computer Application
Paper Code : BCA119
[Paper: IV –Basic Mathematics (Bridge Course)]

B.C.A. - IV Semester
Computer Application
Paper Code : BCA120
[Paper: I – Object Oriented Programming Using C++]

Unit-I

Features of C++, OOP vs. procedure-oriented programming, OOP Concepts: Abstraction, Inheritance, Polymorphism, Data Binding, Encapsulation, Classes, subclasses and Objects; Basics of C++: Data Types and sizes, Variable, Constants and its types, Use of « and » operators, Operators and Expressions: Operators:-Arithmetic, Relational, Assignment, Logical, Increment and Decrement Operators (++ and --), Operate-Assign' Operators, Expressions, Operator Precedence, Precedence and Order of Evaluation, Conditional Expression, Casting and type conversion.

Unit- II

Program Flow & Decision Control: if, if - else, if - else if, Loop Control: while, do - while, for, break, continue, Case Control: switch, goto; Functions/Procedures, Returning values from functions, Arguments Passed by Value, Passing Addresses of Arguments, Pointers and Arrays: Pointer Initialization, Pointer Operators, Pointer Arithmetic, Functions and pointers, Arrays, Initializing Arrays, Passing Arrays to Functions, Pointers and Arrays, Pointer to an Array, Array of pointers, Strings: String I/O, Arrays of Strings, Structures, Arrays of Structures.

Unit-III

Binding Data & Functions: Defining a Class, Creating an Object, Scope, Data Abstraction, Data Encapsulation, 'this' Pointer, Dynamic Creation of Objects, Constructors and Destructors: Parameterized & Copy constructor, Member Functions & Methods, Friend Class and Friendly Functions, Returning Objects, Arrays of Objects.

Unit-IV

Function and Operator Overloading, Rules for Overloading, Operator overloading and its uses: Overloading unary and binary operators, Overloading the Assignment Operator, Overloading the « Operator, Overloading the Increment & Decrement Operator, Converting data types: Basic to class type, Class to Basic Type, Class to Another Class Type.

Unit-V

Reusing Classes: Inheritance-Base and Derived classes, Inheritance types, Scope Resolution Operator, Access Modifiers, Multiple & Multilevel Inheritance, Calling Base Class Constructor, Overriding Base Class Members, Virtual functions and Polymorphism: Virtual & non-virtual Overriding, Rules for Virtual Functions, Pure Virtual Functions, Static and Dynamic Binding, Virtual Base Classes, Templates, Exception Handling, Throwing an exception.

Text books:

1. C++, The Complete Reference, 4th Edition, Herbert Schildt, TMH.
2. Object Oriented Programming in C++, 4th Edition, R.Lafore, SAMS, Pearson Education

Reference Books:

1. An Introduction to OOP, 3rd Edition, T. Budd, Pearson Education, 2008.
2. Programming Principles and Practice Using C++, B.Stroutstrup, Addison- Wesley, Pearson Education.
3. Problem solving with C++, 6th Edition, Walter Savitch, Pearson Education, 2007.
4. The Art, Philosophy and Science of OOP with C++, R.Miller, SPD. OP in C++, J3rd Edition, T.Gaddis, J.Walters and G.Muganda, Wiley DreamTech Press.
5. An Introduction to OOP in C++ with applications in Computer Graphics, 2nd Edition, G.M.Seed, Springer.
6. Programming with ANSI C++, B.Trivedi, Oxford Press.

B.C.A. - IV Semester
Computer Application
Paper Code : BCA121
[Paper : II –Computer Graphics and Multimedia]

Unit-I:An Introduction Graphics System

Computer Graphics Fundamentals, Application of Computer Graphics, Display Devices:Cathode-Ray tubes, Raster-Scan Display& Random Scan Systems,Color CRT Monitors, Flat-Panel Displays, Input Devices, Graphics Software, Interactive devices.Video Card/display cards

Unit-II: Output Primitives

Line Drawing Algorithms:DDA Algorithm,Bresenham's Algorithm,Parallel Line Algorithm.
 Circle generating Algorithm:Midpoint Circle generating algorithm.
 Filled Area Primitives:Scan-Line Polygon Fill Algorithm,Inside-Outside tests, Boundary-Fill Algorithm, Flood Fill Algorithm, Aliasing and Antialiasing

Unit-III:2D Transformations

2-D Viewing and Clipping: Viewing Transformations, Point Clipping & Line Clipping Algorithms, Polygon Clipping algorithms, 2D Geometric Transformations: Basic transformations (Translation, Rotation, Scaling), Matrix Representation & Homogeneous Coordinates, Composite transformations, Reflection and Shear.

Unit-IV:3D transformations

3D Viewing Transformation, Projections: Parallel Projection (Orthographic & Oblique Projections, Isometric Projections), Perspective Projections, 3D Geometric Transformations: Translation, Rotation, Scaling, Matrix Representation, 3D Object Representations: Polygon Surface and Polygon table, Bezier curves and surfaces.

Unit-V:Multimedia,Photoshop s/w& CorelDraw

Fundamentals of Multimedia, Animation,
 Adobe Photoshop CS4: Menus and panels, Exploring the Toolbox, Working with Images Adjusting Canvas Size & Canvas Rotation, Creating, Selecting, Linking & Deleting Layers, Painting with Selections, Red Eye Tool.
 CorelDraw: Command Bars & Tools, Drawing Area-Objects-Lines, Working with Text & Artistic Media Tool, Fills & Modifying Outlines, Templates, Drawing and Editing Curves and Lines, Working with Layers & Creating a Master Layer, Brush Tools and Adding Objects, Interactive Tools,

Text Books:

1. Procedural Elements for Computer Graphics, D.F. Rogers, Tata McGraw Hill
2. Fundamentals of Interactive Computer Graphics, J.D. Foley and A.D. Van, Addison-Wesley.
3. How to Do Everything Adobe Photoshop CS4, Chad Perkins, Tata McGraw Hill
4. Corel Draw X4: The Official Guide, (Paperback), Gary David Bouton, Tata McGraw Hill

Hill

Reference Books:

1. Mathematical Elements for Computer Graphics,, Rogers and Adam, Tata McGraw Hill.
2. Theory & Problem of Computer Graphics, Plastock, Schaum Series.
3. Computer Graphics, Tosijasu, L.K., Springer-verleg
4. Principles of Interactive Computer Graphics, Newman, Tata McGraw Hill.

B.C.A. - IV Semester
Computer Application
Paper Code : BCA122
[Paper: III –Computer Organization and Architecture]

Unit-I : Pipeline:

Linear: pipeline processor, Non linear pipeline processor, Instruction pipeline design, Mechanisms, Dynamic instruction scheduling, Arithmetic pipeline design, Super-scalar processors, VLIW architecture.

Unit-II: Memory Hierarchy and I/O Organization On:

Cache memories, Cache coherence, High bandwidth memories, high bandwidth I/O, Disk I/O, Bus specifications and standards.

Unit-III : Parallel Computer Models & Program parallelism:

Classification of Machines, SISD, SIMD & MIMD, Condition of parallelism, data and resource dependencies, Program partitioning & scheduling, grain size latency, control flow versus data control, data flow architecture.

Unit-IV : Synchronous Parallel Processing:

Vector instruction types, vector access memory schemes, vector and symbolic processors, SIMD architecture, SIMD parallel algorithms, SIMD computers and performance enhancements.

Unit-V :System Interconnection:

Network properties and routing, static interconnection networks, dynamic interconnection networks, Multiprocessor system interconnection, Multistage & combining networks.

Text Books

1. Flynn Computer Architecture: Pipelined and parallel processor design, JB, Boston.
2. Computer Architecture & Parallel processing - Kai Hwang 7 Briggs. (MGH).
3. Computer System Architecture, M. Morris Mano, PHI/Pearson Education.
4. Computer Organization, C Hamacher, Z Vranesic, SafwatZaky, McGraw Hill.
5. Computer Architecture and Organization, J. P. Hayes, Tata McGraw-Hill.

Reference Books:

1. Parallel Computer Arch.& Algo, R.W. Hockney, C.R. Jesshope, Adam Hilger.
2. Structured Computer Organization, A. S. Tanenbaum, Pearson Education.
3. Fundamentals of Computer Organization, P. Dandamudi , Springer.

B.C.A. - IV Semester
Computer Application
Paper Code : BCA123
[LAB: I –Programming Lab Using C++]

List of Sample Problems/Experiments:

1. Write a C++ program to find the sum of individual digits of a positive integer.
2. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.
3. Write a C++ program to generate the first n terms of the sequence.
4. Write a C++ program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
5. Write C++ programs that use both recursive and non-recursive functions
 - a) To find the factorial of a given integer,
 - b) To find the GCD of two given integers,
 - c) To find the nth Fibonacci number.
6. Write a C++ program that uses a recursive function for solving Towers of Hanoi problem.
7. Write a C++ program to find both the largest and smallest number in a list of integers.
8. Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:
 - a) Reading a matrix,
 - b) Printing a matrix,
 - c) Addition of matrices
 - d) Subtraction of matrices.
 - e) Multiplication of matrices.
9. Write a C++ Program to Explain concept of CLASS & OBJECT.
10. Write a C++ program to explain function overloading.
11. Write a C++ program to overload + operator.
12. Write a C++ program to explain Constructor, parameterized Constructor, Copy Constructor.
13. Write a C++ program to explain Destructor.
14. Write a C++ program to explain Inheritance.
15. Write a C++ program to implement polymorphism.

B.C.A. - IV Semester

Computer Application

Paper Code : BCA124
[LAB: II – Multimedia Lab]Series of Practical Curriculums**Photoshop:**

1. (i) Handling different file formats and interchanging them, changing the resolution, color, grayscales and size of the images
- (ii) Using, brushes and creating multicolor real life images. Cropping, rotating, overlapping, superimposing, pasting photos on a page, Creation of a single image from selected portions of many, Developing a commercial brochure with background tints, Creating an image with multi-layers of images and texts. Applying masks and filtering on images.

CoreIDRAW X4 Part 1

- Getting Started with CoreIDRAW
- Starting CoreIDRAW
- Working with Command Bars
- Working with Layers
- Examining a Master Page
- Creating a Master Layer
- Working with Layers
- Using Brush Tools and Adding Objects
- Working with Interactive Tools
- Using Advanced Techniques for Text Manipulation
- Working with Paragraph Text
- The PowerClip Feature and the Envelope Tool
- Creating Bulleted Lists
- Working with Vector and Bitmap Graphics
- Converting Vector Objects to Bitmaps
- Working with Bitmap Graphics
- Introduction to CoreITRACE
- Advanced Output Options
- Preparing a Document For Printing
- Other Printing Options

हिन्दी भाषा
सत्र 2020-21
पंचम (सेमेस्टर)
विषय कोड **BCA125** :अनिवार्य प्रश्न पत्र
बी.एससी./बी.सी.ए.

- इकाई – 1 अशुद्धि संशोधन – वाक्य शुद्धि, शब्द शुद्धि, वर्तनीगत व उच्चारणगत, शब्दार्थगत, अशुद्धियों को शुद्ध करना, पत्राचार प्रकार।
- इकाई – 2 मानक भाषा – सर्जनात्मक भाषा, जनसंचार की भाषा एवम छ.ग. की विविध बोलियाँ, बोली एवं भाषा में अंतर।
- इकाई – 3 संवाद कला, वार्तालाप – वाचन एवं मंच-संचालना
- इकाई – 4 नाट्य- प्रदर्शन, द्रुत-पठन, लेखक परिचय एवं उनके नाटक/एकांकी
1. ध्रुवस्वामिनी – जयशंकर प्रसाद
 2. अषाढ का एक दिन – मोहन राकेश
 3. अंधेर नगरी – भारतेन्दु हरिश्चन्द्र
 4. दीपदान – डॉ. रामकुमार वर्मा
 5. भोर का तारा – जगदीशचन्द्र माथुर
- इकाई – 5 शब्द चयन – (तत्सम, तदभव, देशज, विदेशी शब्द), समाचार लेखन, आलेख लेखन, निबंध लेखन, सार्वजनिक एवम सामाजिक वार्तालाप।
- प्रायोगिक – 45 घण्टे
- नाट्य-मंचन, मंच-संचालन, वार्तालाप के माध्यम से बोली एवम् भाषा का प्रदर्शन ग्रामीण एवं शहरी क्षेत्र में नुक्कड़-नाटक का प्रदर्शन एवं वार्तालाप। (संवाद-कौशल प्रदर्शन)
- सहायक पुस्तकें –
1. प्रयोजन मूलक हिन्दी – विनोद गादेरे
 2. हिन्दी ब्याकरण एवं रचना – डॉ. प्रभा ब्यौहार
 3. हिन्दी – नाटक (संकलन)

**V Semester
Syllabus
Skill Based Course
Communicative English
Session 2020-21
Paper Code : BCA126
Class B.Sc./B.C.A -**

Theory

- UNIT - I 1. Introduction to Communication
 2. Notice, Agenda and Minutes
- UNIT - II 1. Interview and Interviewing Skills
 2. Speeches
- UNIT - III 1. Presentations
 2. Meetings
- UNIT - IV 1. Non - Verbal Communication
 2. Vocabulary Development
- UNIT - V 1. Editing Skills
 2. References Skills

Ref. Books : Synergy by Orient Blackswan.

Skilled Based Fieldwork

Speeches, Presentation, Hosting a program, Demonstration in various organizations, Communication in Various fields, NEWS Reading, Story Narration.

Note : There will be viva voce on the basis of skilled based field work.

B.C.A. - V Semester
Computer Application
Paper Code : BCA127
[Paper: III – Numerical Analysis]

Unit-I : Solution of Polynomial and Transcendental Algebraic Equations

Bisection method, Regula falsi method & Newton Raphson Method, Secant Method, Iteration Method, Solution of Cubic & Biquadratic Equation.

Unit-II : Simultaneous Equations and Matrix

Gauss -Elimination Method, Gauss -Gordon Method and Pivoting. Gauss Seidel Iterative Method, Reduction to lower or upper Triangular forms , Inversion of matrix , method of partitioning , Characteristics equation of matrix , Power methods , Eigen values of matrix , Transformation to diagonal forms.

Unit –III : Interpolation - Single Variable Functions

Newton's Interpolation formula, Newton's Forward and Backward Difference Interpolation Formula, Langranges Interpolation formula, Newton's Divided Difference Interpolation Formula.

Unit –IV : Numerical Differentiation and Integration

Newton - cotes integration formula, Trapezoidal Rule, Simpson's One-Third and Three-Eight Rule, Waddle's Rule.

Unit-V : Numerical Solution of Ordinary Differential and Integral Equation

Numerical Solution of first order Ordinary Differential Equations, one step method, Euler's, Picard's and Taylor's series Methods, Picard's Methods for successive approximations, Runga-Kutta Method.

Text Books:

1. Numerical methods, B.S. Garewal,
2. Introduction to Numerical Methods, S. Shastri, TMH.
3. Numerical methods for Science and Engineering, Jain M.K.

B.C.A. - V Semester
Computer Application
Paper Code : BCA128

[Paper: IV – Software Engineering and Project Management]

Unit-I : Software Engineering and Process models

Software myths, Software engineering- A layered technology, Software Development Life Cycle, Process models: waterfall model, Incremental process models, Evolutionary process models, The Unified process; Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, software requirements document.

Unit II : Requirements and Design Engineering

Feasibility studies, Requirements elicitation and analysis, Requirements . validation, Requirements management, System models: Context Models, Behavioral models, Data models, Object models, Design concepts, the design model, software architecture, Data design, Architectural styles and patterns, Architectural Design.

Unit-III : Testing Strategies and Product metrics

A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging, Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Unit –IV : Plans for testing

Snooping for information, Coping with complexity through teaming, Testing plan focus areas, Testing for recoverability, Planning for troubles, Preparing for the tests: Software Reuse, Developing good test programs , Data corruption, Tools, Test Execution .Testing with a virtual computer, Simulation and Prototypes, Managing the Test, Customer's role in testing

Unit-V : Software Project Management

Evolution of Software Economics, Life Cycle Phases and Process artifacts, Model based software architectures, Software process workflows, quality indicators, life-cycle expectations, CCPDS-R Case Study and Future Software Project Management Practices

Text Books:

1. Fundamentals of Software Engineering, Rajib Mall, PHI Learning Pvt. Ltd.
2. Software Engineering, Ian Sommerville, Pearson Education Inc., New Delhi.
3. Software Engineering: A Practitioner's Approach. Roger S. Pressman, Tata McGraw-Hill
4. Software Project Management, Walker Royce, Pearson Education.

Reference Books:

1. Software Engineering, Shari L, Joanne M. Atlee, Pearson Education, Inc. New Delhi.
2. Software Engineering, Pankaj Jalote, Wiley India Pvt. Ltd., New Delhi.
3. Software Engineering, Dines Bjorner, Springer India Pvt. Ltd . New Delhi
4. Managing the Software Process, *Watts S. Humphrey*, Pearson Education.
5. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, TMH.
6. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly.

B.C.A. - V Semester
Computer Application
Paper Code : BCA129
[Paper: V – Database Design and RDBMS]

Unit-I : Introduction to DBMS

Data & Information, File systems versus Database systems, Data Models, Schemas and Instances, Data Abstraction, Data Independence, Database languages and Interfaces, DBMS Architecture, Data Independence, Database Characteristics: Data modeling using Entity - Relationship (ER) Model: Entity sets, attributes and keys, Relationship types, sets, roles and structural constraints, Weak Entity types. Data Models: Relational, Network, Hierarchical and Object Oriented, Enhanced E-R Modeling.

Unit-II : Relational Model and RDBMS

Relational data model concepts, Codd's 12 rules, Relational model constraints and schemas, Relational Algebra and Relational calculus, Relational database design by ER & EER to Relational Mapping, Overview & Architecture of commercial RDBMSs: Oracle, SQL Server. My SQL etc., Database Language: SQL, SQL Programming Techniques: DDL, DML, DCL query statements, Constraints and Triggers, Views and Indexes, SQL in Server Environment.

Unit –III : Database Design Concepts

Data dependency, Armstrong's Axioms, Functional dependencies and Normalization of Relational Databases, First, Second and Third Normal forms, Boyce-Codd Normal form (BCNF), Relational Database design Algorithms and further dependencies, De-normalization.

Unit-IV : Transaction Processing

ACID Properties of Transactions, Concurrency control, Serializability and Recoverability, Transaction support in SQL, Locking Techniques. Time Stamp ordering, Validation Techniques, Granularity of Data Items, Database recovery techniques - Shadow paging, Log Based Recovery, ARIES recovery algorithm, Database Security: Access control, Statistical Database Security, Deadlock: Detection, Avoidance and Recovery.

Unit –V : Special Purpose Databases

Semi-structured Data Model, OO Data Model, OODBMS, Object-Based Databases, Object Relational Databases: XML and Web Databases, Structure of XML, Temporal Databases, Distributed Databases, Deductive Databases, Mobile Databases, Multimedia Databases, GIS Databases, Spatial Databases.

Text Books:

1. Fundamentals of Database Systems, R Elmasri & S B. Navathe, Pearson Education.
2. Database Systems Concepts, A Silberschatz, H F. Korth & S. Sudarshan, McGraw-Hill.
3. Fundamentals of Database Management Systems, Mark L. Gillenson, Wiley India Pvt.
4. Introduction To Database Systems, C.J.Date, Longman, Pearson Education

Reference Books:

1. Database Systems: A Complete Book, Molina, Ullman, J. Widom, Pearson Education.
2. Database Systems: Design, Implementation, and Management, Peter Rob & Carlos Coronel, CENGAGE Learning India Pvt. Ltd., New Delhi.
3. Database Systems Using Oracle, Nilesh Shah, PHI Learning Pvt. Ltd., New Delhi.
4. Database Management Systems, R Ramakrishnan, J Gehrke, McGraw-Hill Education
5. Database Development and Management, Lee Chao, Auerbach Publications.

B.C.A. - V Semester
Computer Application
Paper Code : BCA130
[Paper: VI – Introduction to AI and Expert System]

Unit-I : Overview of Artificial Intelligence

Definition & Importance of AI, Intelligent Agents: Agents & Environments, Emergence of Intelligent Agents, PEAS Representation for an Agent, Types of Agents; Knowledge: General Concepts: Introduction, Definition and Importance of Knowledge, Knowledge-Based Systems and Representation of Knowledge, Knowledge Organization, Knowledge Manipulation and Acquisition of Knowledge.

Unit-II : Problem Solving and Search Strategies

Solving Problems by Searching, Examples of Search Problems, Problem Formulation, Uninformed Search Techniques- DFS, BFS, Iterative Deepening, Comparing Different Techniques, Informed search methods - heuristic Functions, Hill Climbing, Simulated Annealing, A*, Searching And-Or Graphs, Constrained Satisfaction Problems: Various CSP problems, map, Coloring, Crypt Arithmetic, Backtracking for CSP, Local Search, Adversarial Search: Games, Minimax Algorithm, Alpha Beta pruning.

Unit-III : Knowledge Representation, Reasoning and Structured Knowledge

Syntax and Semantics for Propositional logic, Syntax and Semantics for FOPL, Properties of Wffs, Unification, Forward and backward chaining, Conversion to Clausal Form, Inference Structured Knowledge: Graphs, Semantic Net. Associative Networks, Frames, Frame Structures, Conceptual Dependencies and Scripts.

Unit –IV : Learning and Planning

Learning from Observations, General Model of Learning Agents, Inductive learning, learning Decision Trees, Introduction to neural networks, Perceptrons, Multilayer feed forward network, Application of ANN, Planning problem, Planning with State Space Search, Partial Order Planning, Hierarchical Planning, Conditional Planning

Unit-V : Expert Systems Architectures

Introduction, Rule Based System Architecture. Non-Production System Architecture, Dealing with uncertainty. Knowledge Acquisition and Validation, Knowledge System Building Tools

Text Book:

1. Artificial Intelligence: A Modern Approach, S Russell & P Norvig, Pearson Publication
2. Principles of Artificial Intelligence, Nils J. Nilsson, Narosa Publication.
3. Introduction to Artificial Intelligence and Expert System, Dan W. Patterson. PHI.
4. Artificial Intelligence, Elaine Rich, Kevin Knight, Tata McGraw Hill.

Reference Books:

1. AI-Structures & Strategies for Complex Problem Solving, G Lugar. Pearson Educations
2. Artificial Intelligence: an Engineering approach, Robert J Schalkolf, McGraw Hill.
3. Artificial Intelligence, Patrick H Winston, 3rd edition, Pearson Educations
4. Decision Support Systems and Intelligent Systems, Efraim Turban Jay E. Aronson. PHI.
5. Artificial Intelligence-A System Approach, M. Tim Jones, Infinity Science Press
6. Artificial Intelligence - Strategies, Applications, and Models through Search, Christopher Thornton and Benedict du Boulay, New Age International Publications.

B.C.A. - VI Semester
Computer Application
Paper Code : BCA131
[Paper: I – .Net Technology]

Unit-I: .NET framework & programming with C#.

.Net definition, Development of .net, .net framework, Framework versions, Features of .net. Inside a C# programming language, Data Types, Boxing & Un-Boxing. Defining a class in C#. Conditional statements, Looping Construct, Arrays. Exploring Visual Studio NET, Object oriented Programming Concepts: Class, Objects, Inheritance, Polymorphism

Unit-II : Advance topics in C# & Windows Programming.

Interface, structure, Properties, Constructor, Destructor, indexers, Delegates, Events. Namespaces, collections.

Exception and Exception Handling.

Windows Programming basic, Developing a Windows Application under Visual Studio, Properties, Events,

Working with Control: Form, Button, TextBox, CheckBox, RadioButton, Treeview, Listview, ListBox, Timer etc...

Data binding to Controls, Advanced Database Programming using ADO.net.

Unit-III : Programming with ASP.net

Introduction to ASP, Building a Web Application, Examples Using Standard Controls, Using HTML Controls, Validating Form Input Controls using Validation Controls (Required Field, Compare, Range, Regular Exp., Custom validation control) Navigation Controls: Understanding Site Maps, SiteMapPath Control, Formatting the SiteMapPath Control, Menu Control, Creating a Layout Using Master Pages, Membership and Role Management, Login Controls, Securing Applications, Using Crystal Reports in Web Forms.

Unit-IV : Database and ASP.NET Technology:

Binding to Databases using Controls, Data Management with ADO.net, SQL data source, Entity Data Model, Binding GridView.

Data Access with LINQ to SQL : Creating LINQ to SQL Entities, Performing standard database commands with LINQ to SQL. ASP.NET Configuration, Configuration Setting, ASP.NET Security: Authentication, Windows based, Form based, Passport authentication, Authorization., ASP.NET membership Concept. State Management.

Caching Application Pages and Data

Unit-V : Advanced Applications with .NET Technology

XML Web Services: Setting WebMethod Attribute, Setting WebServices Attribute, Invoking an XML Web Service with HTTP-Get, HTTP-Post & SOAP, XML Web Services Behavior, AJAX (Asynchronous JavaScript and XML): Server Side & Client Side Ajax, Ajax Toolkit, Setting up and implementing Ajax, SQL Server Administration: Setup Database server of a website, Converting data between MDF to DBO, DBO to XLS or in any other format, Backup and Restore of data, FTP Management, Setting up FTP Server (Live), Sending Emails, Designing email panel, How to send an email to various users, Sending auto emails.

Text Books:

1. Professional Visual Studio 2013, Bruce Johnson, Wrox Publication
2. Beginning ASP.NET 4.5.1: in C# and VB, Ivar Spaanjaars, Wrox Publication
3. Professional C# 5.0 and .NET 4, C. Nagel, J Glynn, Morgan Skinner, Wrox Publication
4. Pro ASP.NET 3.5 in C# 2008, Matthew MacDonald and Mario S, Wrox Publication
5. Pro ASP.NET MVC 3 Framework, Adam Freeman; Steven Sanderson, Apress
6. Professional ASP.NET MVC 3, Jon Galloway; Phil H; Brad Wilson; K. Scott Allen, Wrox

Reference Books:

1. Pro ASP.NET 4 in C# 2010, Matthew Mac Donald; Adam Freeman; Mario S, Apress
2. Microsoft® ASP.NET 4 Step by Step, George Shepherd, Microsoft Press

B.C.A. - VI Semester
Computer Application
Paper Code : BCA132
[Paper: II – Data Mining and Warehousing]

Unit-I : Overview and Concepts:

Need for data warehousing, Basic elements of data warehousing, Trends in data warehousing. Planning And Requirements: Project planning and management, Collecting the requirements. Architecture And Infrastructure: Architectural components, Infrastructure and metadata.

Unit-II : Data Design and Data Representation:

Principles of dimensional modeling, Dimensional modeling advanced topics, data extraction, transformation and loading, data quality.

Unit-III : Information Access and Delivery:

Matching information to classes of users, OLAP in data warehouse, Data warehousing and the web. Implementation and Maintenance: Physical design process, data warehouse deployment, growth and maintenance.

Unit-IV : Data Mining Introduction:

Basics of data mining, related concepts, Data mining techniques Data Mining Algorithms: Classification, Clustering, Association rules. Knowledge Discovery: KDD Process.

Unit –V : Web Mining:

Content Mining, Web Structure Mining, Web Usage mining. Advanced Topics: Spatial mining, Temporal mining. Visualization: Data generalization and summarization-based characterization, Analytical characterization: analysis of attribute relevance, Mining class comparisons: Discriminating between different classes, Mining descriptive statistical measures in large databases Data Mining Primitives, Languages, and System Architectures: Data mining primitives, Query language, Designing GUI based on a data mining query language, Architectures of data mining systems Application and Trends in Data Mining: Applications, Systems products and research prototypes, Additional themes in data mining, Trends in data mining

Text Books:

- 1 Data Mining-Concepts & Techniques, J. Han & M Kamber, Morgan Kaufmann Pub
- 2 Introduction to Data Mining. P N Tan, M. Steinbach & Vipin Kumar, Pearson education
- 3 Data Mining Techniques - Arun K Pujari, 2nd edition, Universities Press
- 4 Data Warehousing in the Real World - Sam Aanhory & Dennis Murray Pearson Edn

Reference Books:

- 1 Insight into Data Mining. K P. Soman, S. Diwakar. V. Ajay, PHI, 2008
- 2 Data Warehousing Fundamentals - Paulraj Ponnaiah Wiley student Edition
- 3 Data Mining Introductory and Advanced Topics, Margaret H. Dunham, Pearson Education 2004
- 4 Principles of Data Mining, David Hand, Heikki Manila, Padhraic Smyth, PHI 2004
- 5 Building the Data Warehouse. W.H. Inmon, Wiley, 2003.
- 6 Data Warehousing, Data Mining & OLAP, Alex Bezon, Stephen J Smith, McGraw-Hill.

B.C.A. - VI Semester**Computer Application****Paper Code : BCA133****[Paper: III – Current Trends and Technology in Computer Science]****Unit-I : Machine Learning:**

Concept of Machine Learning, Applications of Machine Learning, Key elements of Machine Learning, Supervised

vs. Unsupervised Learning.

Neural Network: Introduction, Architecture, Model Representation, Application.

Unit-II : Grid Computing & Monitoring

Grid Architecture and Service modeling, Grid resource management, Grid Application trends, Characterization of Grids, Organizations and their Roles, Grid Computing Road Maps, Review of Web Services-OGSA-WSRF.

Grid Monitoring: Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems- GridICE - JAMM -MDS-Network Weather Service-R-GMA-Other Monitoring Systems- Ganglia and GridM.

Unit-III: Big Data

Big Data and its importance, Characteristics of Big Data, What Comes Under Big Data, Who's Generating Big Data, Challenges in Handling Big Data, How Big Data Impact on IT, Big Data Analytics, Big data applications, Future of Big Data, Risks of Big Data.

Unit-IV : Cluster Computing

Introduction: Overview of Cluster Computing, The Role of Clusters, Definition and Taxonomy Of Parallel Computing, Hardware System Structure, Node Software, Resource Management, Distributed Programming, Limitations, Cluster Planning, Architecture , Node Hardware and Node Software, Design Decisions.

Unit-V : Cloud Computing

Cloud Computing services models and features in SaaS, PaaS and IaaS; Service oriented architecture and web services; Features of cloud computing architectures and simple case studies, Virtualization-Characteristic features, Taxonomy Hypervisor, Virtualization and Cloud Computing, Pros and Cons of Cloud Computing, Technology Examples/Case Studies.

Text Books:

1. Distributed and Cloud Computing, Kaittwang Geoffrey C.Fox and Jack J Dongra, Elsevier India 2012.
2. Mastering Cloud Computing- Raj Kumar Buyya, Christian Vecchiola and S Tanurai Selvi, TMH, 2012.
3. Beowulf Cluster Computing with Linux, William Gropp, Ewing Lusk, Thomas Sterling, MIT Press, 2003
4. Grid Computing, Joshy Joseph and Craig Fellenstein, Pearson Education 2004. 5. The Grid Core Technologies, Maozhen Li, Mark Baker, John Wiley and Sons , 2005.
5. "Understanding Big data", Chris Eaton, Dirk deroos et al., McGraw Hill, 2012.
6. Neural network and Learning Machines, Simon Haykin, Pearson Education, 2011.

Reference Books:

1. Cloud Computing, John W. Ritting House and James F Ramsome, CRC Press, 2012 Enterprise Cloud Computing, Gautam Shroff, Cambridge University Press, 2012.
2. In Search of Clusters: The ongoing battle in Lowly Parallel Computing, Gregory F P Fister, Second Edition, Prentice Hall Publishing Company, 1998.

3. The Grid 2 - Blueprint for a New Computing Infrastructure, Ian Foster and Carl Kesselman, Morgan Kaufman - 2004.
4. Grid Computing: Making the Global Infrastructure a reality, Fran Berman, Geoffrey Fox, Anthony J.G. Hey, John Wiley and sons

B.C.A. - VI Semester

Computer Application

Paper Code : BCA134

[Lab 1: Practical based on .NET Technology]

1. Write a C# program to explain Conditional statement.
2. Write a C# program to explain every loop construct available in C#.
3. Write a C# program to explain boxing & un-boxing.
4. Write a C# program to explain concept of CLASS & Object.
5. Write a C# program to explain Array Class.
6. Write a C# program to explain properties.
7. Write a C# program to explain Constructor & Destructor.
8. Write a C# program to explain Exception Handling.
9. Write a C# program to explain Collection.
10. Write a C# program to Build a Windows form. Insert various controls in the form.
11. Create a Web Page & Insert basic html Control & explain working of every control.
12. Explain Validation control Using ASP.NET validation control.
13. Explain Navigation control by creating web page by ASP.NET
14. Explain Login control by suitable ASP.NET web page.
15. Create web site using master page.
16. Create web site and explain various Form input control.
17. Create a web site and bind the control using sqldatasource.
18. Create a web site and bind the control using EDM.
19. Create a web site and perform some database operation (insert,update,delete) by using your own code.
20. Create a web site and insert various AJAX control.
21. Design an E-mail Panel.

B.C.A. - VI Semester
Computer Application
Paper Code : BCA135
[Project: Major Project]

It is compulsory, that students would have group of maximum of two students and project should be done under Government Sectors/ Public Sector / Pvt. Limited SAA/ Company/ Software Technology Park of India/ ISO 9001 certified company only.

The students should not make any project under local or private institutions.

The students should make project themselves and project will not be copy of other project.

Steps for Live Project

1. Getting customer's requirements
2. Designs, database and business logics
3. Developing software application project
4. Testing and implementing the project
5. Troubleshooting the project application after Implementation
