

Bachelor of Computer Applications (BCA)

Curriculum Based on Choice Based Credit System (CBCS) and

Outcome Based Learning (OBL)

Applicable from July 2020 Session

Department of Computer Science and Applications



**MakhanlalChaturvedi National University of
Journalism and Communications**

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About the Department of Computer Science & Applications

The Department of Computer Science and Applications was established in the year 1993 with the aim of developing professionals in main stream of Computer Science and Applications. The Department offers Under Graduate, Post Graduate degree courses as well as PhD Research Degree courses through the University Teaching Department UTD at Bhopal. The Department analyses regularly the market trends and new developments in the area, conducts massive brainstorming with leading academia and industry professionals to develop the curricula.

The Department is committed to provide excellence in teaching. It has a rich knowledge pool of well-trained faculty and a modern computer lab enabled to impart all required knowledge, along with its own library with latest books on various advanced areas in computers. Regular hands-on workshops are conducted to update students with the latest technology.

Many of the alumni are working in top companies including IBM, Microsoft, American Express Bank, Wipro, Infosys, Samsung, Microsoft, WorldPay, CISCO, HCL, Jindal, Web Dunia and more in India as well as abroad, apart from few also being entrepreneurs and some other, in academics with prestigious institutions.

About the Bachelor of Computer Application (BCA) Program

Bachelor of Computer Applications (BCA) is three years Undergraduate Programme. The curriculum of BCA is designed to meet the growing demand of qualified professionals in the field of ICT. It comprises of the core subjects like database, networking, data structure, core programming languages like C, C++, .NET and Java. Students also get exposure to advanced topics like cyber security, mobile software. Elective papers help students to have an exposure in Linux Shell Programming, Python Programming and Information Technology Trends related subjects.

Bachelor of Computer Applications (BCA)
Level: Undergraduate Regular
Duration: 3 years (6 semesters)
Eligibility Criteria: 10+2 from recognized Board

Program Objectives

- To empower students with basic skills of various technologies.
- To develop the ability to identify, analyze, formulate and develop computer applications.
- To enable the students to select modern computing tools and techniques and use them with practical expertise.
- If you are looking for challenging roles in the IT industry, Computer Science & Applications, web and mobile development, data analysis, information security etc., this Programme is for you.

Career Path after Completing the Programme

- Software Developer
- Programmer
- Systems Analyst
- Computer Support Engineer
- Database Administrator
- Systems Administrator
- Web Designer & Developer
- Network Administrator

Bachelor of Computer Applications (BCA) Scheme
Choice Based Credit System(CBCS) and Outcome Based Learning (OBL)

Semester	Core Course	Elective: Discipline Specific Elective (DSE)(Choose any One Paper per semester)	Ability Enhancement Compulsory Course (AECC)	Skill Enhancement Course (SEC)	Open Electives** (Choose One Paper per sem)
	14 Papers(6 Credit)	4 Papers(6Credit)	2Papers(3 Credit)	4Papers(3 Credit)	6Papers(3 Credit)
I	Office Automation Using PC Packages* Programming with C and C++ * Digital Electronics Computer Lab-1		Communicative English		Fundamental of Computer & Information Technology OR Information Technology Trends OR Other Electives offered
II	Database Management System* Data Structures* Computer Networks Computer Lab-2		Environmental Science		Computer Hardware and Troubleshooting OR Working with Operating Systems(Dos, Windows and Linux) OR Other Electives offered
III	Web Designing(HTML,CSS, Java Script)* Operating Systems Computer Lab-3	Linux Server Administration OR Multimedia and Animation*		RDBMS using MySQL*	Linux & Shell Programming OR Visual Design with Corel Draw OR Other Electives offered
IV	Programming with Java* Software Engineering Computer Lab-4	Windows Server Administration* OR Cyber Security*		E-Commerce and E-Governance*	Programming with Python OR DTP with Page Maker OR Other Electives offered
V	Dot Net Programming with VB.Net & ASP.Net* Web Development with PHP * Computer Lab-5	Mathematics OR Management Theory &Practice		Mobile Application Development*	Sound Editing with Audacity OR Photo Editing with Photoshop OR Other Electives offered
VI	Cloud Computing * Computerized Accounting with Tally*Computer Lab-6	Project Work		Social Media Marketing*	VBA Programming OR Video Editing with OpenShot OR Other Electives offered

* Indicates the subject having practical examination component.(for Ist two *subjects 4 hours & for 3rd * subject 2 hours in a week)** Open Elective: -As per the CBCS system, in this facility of open elective, students can choose any one subject from the Consolidated list declared by University comprising of all the Open Elective subjects offered by all the departments of the University. In the study institution enrolled students the subjects indicated in this table are definitely available for choice, but for choosing allowed subjects concerned study institution must provide necessary teaching arrangement to enable those choices.

Semester - I

Subject Code	Subject Name	L	T	P	Load	Theory Marks	Internal Marks	Practical Marks	Total Marks
		Credits/Hours							
1BCA1	Office Automation Using PC Packages*	4/4	0	2/4	6/8	80	20	0	100
1BCA2	Programming with C and C++*	4/4	0	2/4	6/8	80	20	0	100
1BCA3	Digital Electronics	5/5	1/1	0	6/6	80	20	0	100
1BCA4	Communicative English	2/2	1/1	0	3/3	40	10	0	50
1BCA5	Open Elective – 1	2/2	1/1	0	3/3	40	10	0	50
1BCA6	Computer Lab-1 is based on above * subjects (+Self Study Lab)	-	-	+0/2	+0/2	0	20	80	100
Semester Totals		17/17	3/3	4/10	24/30	320	100	80	500

Semester –II

Subject Code	Subject Name	L	T	P	Load	Theory Marks	Internal Marks	Practical Marks	Total Marks
		Credits/Hours							
2BCA1	Database Management System*	4/4	0	2/4	6/8	80	20	0	100
2BCA2	Data Structures*	4/4	0	2/4	6/8	80	20	0	100
2BCA3	Computer Networks	5/5	1/1	0	6/6	80	20	0	100
2BCA4	Environmental Science	2/2	1/1	0	3/3	40	10	0	50
2BCA5	Open Elective – 2	2/2	1/1	0	3/3	40	10	0	50
2BCA6	Computer Lab-2 is based on above * subjects (+Self Study Lab)	-	-	+0/2	+0/2	0	20	80	100
Semester Totals		17/17	3/3	4/10	24/30	320	100	80	500

Key: L-Lecture hours, T- Tutorial hours, P-Practical hours, * - Indicates subjects having Practical Exam.

Semester –III

Subject Code	Subject Name	L	T	P	Load	Theory Marks	Internal Marks	Practical Marks	Total Marks
		Credits/Hours							
3BCA1	Web Designing (HTML,CSS, Java Script)*	4/4	0	2/4	6/8	80	20	0	100
3BCA2	Operating Systems	5/5	1/1	0	6/6	80	20	0	100
3BCA3(A)	Linux Server Administration*	4/4	0	2/4	6/8	80	20	0	100
3BCA3(B)	Multimedia and Animation*								
3BCA4	RDBMS Using MYSQL*	2/2	0	1/2	3/4	40	10	0	50
3BCA5	Open Elective -3	2/2	1/1	0	3/3	40	10	0	50
3BCA6	Computer Lab-3 is based on above * subjects (+Self Study Lab)	-	-	+0/2	+0/2	0	20	80	100
Semester Totals		17/17	2/2	5/12	24/31	320	100	80	500

Semester –IV

Subject Code	Subject Name	L	T	P	Load	Theory Marks	Internal Marks	Practical Marks	Total Marks
		Credits/Hours							
4BCA1	Programming with Java*	4/4	0	2/4	6/8	80	20	0	100
4BCA2	Software Engineering	5/5	1/1	0	6/6	80	20	0	100
4BCA3(A)	Windows Server Administration*	4/4	0	2/4	6/8	80	20	0	100
4BCA3(B)	Cyber Security*								
4BCA4	E-Commerce and E-Governance*	2/2	0	½	3/4	40	10	0	50
4BCA5	Open Elective – 4	2/2	1/1	0	3/3	40	10	0	50
4BCA6	Computer Lab-4 is based on above * subjects (+Self Study Lab)	-	-	+0/2	+0/2	0	20	80	100
Semester Totals		17/17	2/2	5/12	24/31	320	100	80	500

Key: L-Lecture hours, T- Tutorial hours, P-Practical hours, * - Indicates subjects having Practical Exam.

Semester –V

Subject Code	Subject Name	L	T	P	Load	Theory Marks	Internal Marks	Practical Marks	Total Marks
		Credits/Hours							
5BCA1	Dot Net Programming with VB.Net & ASP.Net*	4/4	0	2/4	6/8	80	20	0	100
5BCA2	Web Development with PHP*	4/4	0	2/4	6/8	80	20	0	100
5BCA3(A)	Mathematics	5/5	1/1	0	6/6	80	20	0	100
5BCA3(B)	Management Theory & Practice								
5BCA4	Mobile Application Development*	2/2	0	1/2	¾	40	10	0	50
5BCA5	Open Elective –5	2/2	1/1	0	3/3	40	10	0	50
5BCA6	Computer Lab-5 is based on above * subjects (+Self Study Lab)	-	-	+0/2	+0/2	0	20	80	100
Semester Totals		17/17	2/2	5/12	24/31	320	100	80	500

Semester –VI

Subject Code	Subject Name	L	T	P	Load	Theory Marks	Internal Marks	Practical Marks	Total Marks
		Credits/Hours							
6BCA1	Cloud Computing*	4/4	0	2/4	6/8	80	20	0	100
6BCA2	Computerized Accounting with Tally *	4/4	0	2/4	6/8	80	20	0	100
6BCA3	Project Work	0	2/2	4/8	6/10	0	20	80	100
6BCA4	Social Media Marketing*	2/2	0	1/2	¾	40	10	0	50
6BCA5	Open Elective –6	2/2	1/1	0	3/3	40	10	0	50
6BCA6	Computer Lab-6 is based on above * subjects (+Self Study Lab)	-	-	+0/2	+0/2	0	20	80	100
Semester Totals		12/12	3/3	9/20	24/35	240	100	160	500

Key: L-Lecture hours, T- Tutorial hours, P-Practical hours,*- Indicates subjects having Practical Exam.

Instructions: For passing any Theory subject examination minimum 40% marks must be separately scored in Theory Paper and Internal Evaluation for that subject. For passing any Practical subject examination minimum 50% marks must be separately scored in its practical Evaluation for that subject. Aggregate # please refers concerned regulation for details.

Outcome Based Learning: Course Outcomes (COs) & Program Outcomes (POs):

In accordance with the lightest teaching paradigms, this BCA program has been designed on the basis of outcome based learning. At the end of the BCA program, all the students are expected to fulfill the following Programme Outcomes.

PO1 :	Domain Knowledge
PO2 :	Problem Analysis
PO3 :	Design/Development of Solutions
PO4 :	Conduct Investigations of Problems
PO5 :	Modern Tool Usage
PO6 :	Professionals and Society
PO7 :	Environment and Sustainability
PO8 :	Ethics
PO9 :	Individual and Team Work
PO10 :	Communication
PO11 :	Project Management and Entrepreneurship
PO12 :	Life-long Learning

To successfully implement and ensure that these POs are implemented, they have been divided into different courses of the six semesters. Each of this course has been designed to fulfill specific Course Outcomes (COs) indicated in every course (subject). Further a metrics of mapping between the COs &POs have been given with every course, to ensure that the desired outcomes are successfully met. The Mapping Metrics also indicates the level of understanding or mastering the subject numerically from 1 to 5. These correspond to the levels as indicated in the following table:

S N	Level Meaning & Reference	Skill Demonstrated	Question Verbs for tests
1	Remember:1	Ability to Recall Information, Facts, Conventions, Definitions, Jargon, Technical Terms, Classifications, Categories, and Criteria Ability to Recall Methodology and Procedures, Abstractions, Principles, Field Theories	List, Define, Tell, Describe, Recite, Recall, Identify, Show, Label, Tabulate, Quote, Name, Who, When, Where, etc.
2	Understand:2	Knowledge of Dates, Events, Places	Describe, Explain, Paraphrase, Restate, Associate, Contrast, Summarize, Differentiate Interpret, Discuss
3	Apply:3	Mastery of Subject Matter	Calculate, Predict, Apply, Solve, Illustrate, Use, Demonstrate, Determine, Model, Experiment, Show, Examine, Modify
4	Analyze:4	Understanding Information	Classify, Outline, Break Down, Categorize, Analyze, Diagram, Illustrate, Infer, Select
5	Evaluate:5	Grasp Meaning	Assess, Decide, Choose, Rank, Grade, Test, Measure, Defend, Recommend, Convince, Select, Judge, Support, Conclude, Argue, Justify, Compare, Summarize, Evaluate

Semester - I

1BCA1 -Office Automation Using PC Packages

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- To familiarize student with Office Automation and Component of Office Automation.
- To make them comfortable to evaluate, select and use Office Software appropriate to specific task.
- To make them work on Open Software for Office Automation.
- To develop expertise in Word Processing, Spreadsheet, and Presentation Skills.

Course Outcomes:

- Outline Office Suit components with specific application.
- List Open Office Software.
- Apply Word Processing Tools including Document Formatting, Using Graphics, Working with Macro and Mail Merge.
- Apply Spread Sheet Tools including Worksheet formatting, Using Functions, Graphics and Charts.
- Create effective Presentation Using Animation and Transition.

Unit-wise Syllabus

UNIT – I

Introduction to Office Automation Suit, Elements of Office Suit & Area of Use. Word-Processing, Spreadsheet, Presentation Graphics, Database. Introduction of various Office Suites Open Office, Libre Office, WPS Office, Microsoft Office. Word Basics Using Libre Office (open source) : Starting Word Processor, The parts of a Word Processor Window, Menus & Commands, Toolbars & Buttons, Shortcut Menus, Creating a New Document, Different Page Views and Layouts, Applying various Text Enhancements, Formatting Text and Documents: Auto Format, Text Attributes, Paragraph and Page Formatting, Line Spacing, Margins, Borders and Shading, Tabs and Indents, Text Editing using various features, Bullets, Numbering, Working with Styles, Printing & various print options, Spell Check ,Working with Headers and Footers, Tables: Creating a Simple Table, Creating a Table using the Table Menu, Entering and Editing Text in a Table, Selecting in Table, Adding Rows, Changing Row Heights, Deleting Rows, Inserting Columns, Deleting Columns, Changing Column Width.

UNIT – II

Graphics: Clipart, Insert Picture, Using Drawing Features, Drawing Objects, Text in Drawing. Templates: Template Types, Using Templates, Exploring Templates, Modifying Templates. Macros: Macro, Recording Macros, Editing Macros, Running a Macro. Mail Merge: Mail Merge Concept, Main Document, Data Sources, Merging Data Source and Main Document.

UNIT – III

Spreadsheet Basics: Overview of Spreadsheet, Features, Creating a New Worksheet, Selecting Cells, Entering and Editing Text, Entering and Editing Numbers, Entering and Editing Formulas, Referencing Cells, Moving Cells, Copying Cells, Sorting Cell Data, Inserting Rows, Columns, Inserting Cells, Deleting Parts of a Worksheet, Clearing Parts of a Worksheet. Formatting: Page Setup, Changing Column Widths and Row Heights, Auto Format, Changing Font Sizes and Attributes, Using Border Buttons and Commands, Changing Colors and Shading, Hiding Rows and Columns.

UNIT – IV

Function in Spreadsheet, Functions by category: Date and Time functions, Engineering functions, Math and Trigonometry functions, Statistical functions, Text functions. Spreadsheet Charts: Chart parts and Terminology, Instant Charts with the Chart Wizard, Creation of different types of Charts, Printing Charts, Deleting Charts, Linking in Spreadsheet. Spreadsheet Graphics: Creating and Placing Graphic Objects, Resizing Graphics, Drawing Lines and Shapes.

UNIT – V

Creating Presentations: Using Blank Presentation Option, Using Design Template , Adding Slides, Deleting a Slide, Importing Images from Outside, Transition and Build Effects, Deleting a Slide, Numbering a Slide, Saving Presentation, Closing Presentation, Printing Presentation .

References:

- Microsoft Office Step by Step Beth Melton, Mark Dodge , Published with the authorization of Microsoft Corporation by: O'Reilly Media.
- Office 2013 Bible: The Comprehensive Tutorial Resource Paperback – by Lisa A. Bucki (Author), John Walkenbach (Author), Michael Alexander.
- Learning Microsoft Office 2013 by Ramesh Bangia, Khanna Publishers
- www.openoffice.org/documentation/manuals/.../0100GS3-GettingStartedOOo3.pdf
- Open Office for Dummies
(<https://whc.es/OpenOffice%20org%20For%20Dummies.pdf>)
- <https://www.libreoffice.org/get-help/documentation/>
- Libre Office 5.1 Writer, Calc, Math Formula Book- Vol 1 by Lalit mali

Cos	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	2	1	3	1	–	–	3	2	2	2
2	2	2	1	1	3	1	–	3	2	–	2	2
3	3	3	2	2	2	1	–	1	2	1	1	2
4	3	3	2	2	2	1	–	1	2	–	1	2
5	3	3	2	2	2	1	–	1	2	2	1	2

1BCA2 -Programming with C and C++

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- Have Understanding of Programming Language Standards, Problem Solving Techniques, IDE and Compilers for C and C++.
- To have in depth knowledge of Writing, Compiling and Running Programs.
- To understand and Practice Programming Construct: Variable, Operators, Control Structures, Loop, Functions with C and C++.
- To understand and Practice basics of arrays, pointers, preprocessor, Structure and Union
- To learn difference in procedural and Object oriented programming language with understanding of OOPs features and Practice beginner level of Pointers, Preprocessor, Programming

Course Outcomes:

- List and Demonstrate Basic Terminology Used in Computer Programming Write, Compile and Debug Programs in C and C++ Language.
- Understand and Apply Variable, Conditional Statements, Loops, Functions in C and C++.
- Practice Pointers, Structure, Union and Class in Programming.
- Explain and Differentiate the Process of Problem Solving Using Procedural and Object Oriented Programming Language.
- Understand and Practice Object Oriented Programming Concepts in C++.

Unit-wise Syllabus

UNIT-I

Introduction to C Language, Language Standards, Features of Procedural Language specific to C, Structure of C and C++ Program, Introduction to Compilers, Creating, Compiling and Executing C and C++ Programs, IDE Features of Turbo Compiler. Keywords , Identifiers, Variables, Constants, Scope and Life of Variables, Local and Global Variable, Data Types, Expressions. Operators - Arithmetic, Logical, Relational, Conditional and Bit Wise Operators, Precedence and Associativity of Operators, Type Conversion. Library Function, Character Input/Output- getch(), getchar(). getche(), putchar(). Formatted Input/Output- printf() and scanf(), Mathematical & Character Functions in C and C++.

UNIT- II

Control Structures: Declaration Statement, Conditional Statement - if Statement, if-else Statement, Nesting of if Statement, else if Ladder, The?: Operator, switch Statement. Iteration Statements - For Loop, While Loop, Do-While Loop. Jump Statements: break, continue, goto, exit(). Arrays - Concept of Single and Multi-Dimensional Arrays, Array Declaration and Initialization. Strings: Declaration, Initialization, String Functions Using C and C++.

UNIT- III

The Need of Functions, User Defined and Library Function, Prototype of Functions, Prototype of main() Function, Calling of Functions, Function Arguments, Argument Passing: Call By Value and Call By Reference, Return Values. Nesting of Function, Recursion, Array as Function Argument, Command Line Arguments, Basics of Pointers, Pointers Operators, Pointer Arithmetic, Pointers and Function, Pointer and Strings. Preprocessor and its Advantages.

UNIT- IV

Storage Class Specifier- Auto, Extern, Static, Register. Defining Structure, Declaration of Structure Variable, Type def, Accessing Structure Members, Member Access Operator, Nested Structures, Array of Structure, Structure Assignment, Structure as Function Argument, Function that Return Structure, Union. Pointer to Structure, Pointers within Structure, Introduction to Static and Dynamic Memory Allocation, The Process of Dynamic Memory Allocation, DMA Functions : malloc(), calloc(), free(), realloc(), sizeof() Operator. C++ Classes and Object.

UNIT- V

Constructor and its Types, Array of Objects, Object as Argument, Reference Variable, Default Argument, Destructor Function, Object Oriented Programming Concepts. Polymorphism (Operator Overloading, Function Overloading) . Inheritance and its Types. Access Specifier, Virtual Functions, Abstract Base Classes and Pure Virtual Function. Virtual Base Classes.

References:

- Kerninghan& Ritchie “The C Programming Language”, PHI
- Schildt “C:the Complete Reference”, 4th Ed TMH.
- Kanetkar Y. “Let Us C”, BPB.
- Kanetkar Y.: “Pointers in C”,BPB
- Gottfried : “Problem Solving in C”, Schaum Series
- Balagurusami “Programming in ANSI C”,7thed McGraw Hill Education.
- Herbertz Shield, "C++ The Complete Reference "TMH Publication ISBN 0-07-463880-7
- R. Subburaj, 'Object Oriented Programming WithC++ Vikas Publishing House, New Delhi.Isbn 81-259-1450-1
- E. BalgurUswamy, "C++ " TMH Publication ISBN O-07-462038-X
- M. Kumar 'Programming InC++" TMH Publications
- R. Lafore, 'Object Oriented Programming C++"
- Ashok. N. Kamthane, "Object Oriented Programming WithANSi& Turbo C++ ", Pearson Education Publication,ISBN-8j-7808-772-3

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	3	3	2	1	1	-	2	-	2	2
2	3	3	3	3	2	1	1	-	2	-	2	1
3	3	3	3	3	2	1	-	-	2	-	2	1
4	3	2	3	2	2	1	-	-	2	-	2	1
5	3	2	3	2	2	1	1	-	2	-	2	3

1BCA3-Digital Electronics

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
5/5	1/1	0	6/6	80	20	0	100

Course Objectives:

- To understand data representation for digital logic
- To understand the basic blocks of digital logic
- To understand the fundamental organization of a digital computer
- To design simple combination & sequential circuits
- To Know application of Registers.

Course Outcomes:

- Apply the principles of Number System, Binary Code and Boolean Algebra.
- Acquire Knowledge about Logic Gates.
- Design various Combinational and Sequential Circuits.
- Describe various Memory System and Shift Register.
- Understand Processor Organization and Design of Simple Computer.

Unit-wise Syllabus

UNIT-I

Data representation Data Types and Number Systems, Binary Number System, Octal & Hexa-Decimal Number System, Fixed Point Representation, 1's & 2's Complement, Binary, Arithmetic Operation on Binary Numbers, Overflow & Underflow, Floating Point Representation, Codes, ASCII, EBCDIC Codes, Gray Code, Excess-3 & BCD, Error Detection & Correcting Codes Binary Storage and Registers.

UNIT-II

Boolean algebra and digital logic circuits -Logic Gates, AND, OR, NOT,, NOR, NAND & XOR Gates and their Truth Tables, Boolean Algebra, Basic Definition and Properties, Basic Boolean Law's, Demorgan's Theorem, Minimization Techniques, K Map – Two, Three and More Variables maps, Sum of Product & Product of Sums, Don't care conditions.

UNIT-III

Combination Circuits - Half adder & Full adder, Full Subtractor, decimal adder, Code Conversion, Multilevel NAND and NOR Circuits, Decimal adder, decoders, Multiplexers and Demultiplexers.

UNIT-IV

Sequential logic- Flip-Flops - RS, D, JK & T Flip-Flop, Triggering in flip flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, flip flop excitation tables, Design procedure and design of counters. Design with equations.

UNIT-V

Registers, Counters and the memory unit, Shift registers, Ripple counters and Synchronous counters, Inter-register Transfer, Arithmetic Logic and Shift Micro Operation, Conditional Control Statement, Instruction Codes, Processor organization, design of a simple computer.

References:

- Digital Logic and Computer Design by Morris mano
- Computer System Architecture by Morris Mano
- Digital Electronics by Anil Kumar Maini publisher :Wiley and Sons
- Modern Digital Electronics by R. P. Jain publisher Tata Mcgraw-Hill education
- Digital Fundamentals by Thomas I. Floyd publisher:Pearson Education India

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	2	2	2	-	3	-	-	-	1	2
2	3	2	2	2	1	-	3	-	-	-	2	2
3	3	2	2	2	1	-	2	-	-	-	2	2
4	3	3	2	-	1	-	1	1	-	-	2	2
5	3	2	2	-	1	1	1	-	1	-	2	2

1BCA4- Communicative English

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	1/1	0	3/3	40	10	0	50

Course Objectives:

- Learn Basics of Communication.
- Learn and develop the skills of writing, speaking, reading and listening.
- Know telephonic conversation skills, Interview skills and Group Discussion basics.
- Gain the knowledge and develop personality , soft skills ,presentation skills.
- To develop reading skills.

Course Outcomes:

- Inculcate Process of Communication and identify barriers in communication.
- Demonstrate the competency in English language through understandability and practice in four skills of language such as writing, speaking, reading and listening.
- Develop skills for working in team and individually.
- Inculcate soft skills and develop personality through participation in group discussion, mock interview, group and individual presentation
- Practice reading skills in English language specific to eminent Indian Authors.

Unit-wise Syllabus

UNIT-I

The Process of Communication: Communication, the Process of Communication, Barriers of Communication, Different Types of Communication, Characteristics and Conventions of Conversation, Conversational Problems of Second/Foreign Language Users, Difference Between Conversation and Other Speech Events

UNIT- II

Telephone Techniques: Speaking and Listening, Conference Calls, Vocabulary Building, Writing, Grammar and Usage, Pronunciation, Job Applications and Interviews: Reading, Curriculum Vitae, Preparing for an Interview, Listening and Speaking in the Interviews Group Discussions: Group-Discussion, Study Skills, Language Focus, Speaking.

UNIT- III

Soft Skills Practice, Personality Development, Participating in Group Discussion and Job Interviews, Time Management Presentation Skills, Leadership Skills, Assertiveness, Lateral Thinking, Team Work and Interpersonal Skills, Emotional Intelligence, Self-Confidence and Courage, Attitude.

UNIT- IV

Speaking Skills and Presentation: Presentation Design and Delivery. Monologue Dialogue, Group Discussion. Effective Communication/ Mis-Communication. Interview, Public Speech. Effective Writing, Report Writing, Resume, Circular, Notice and letter Writing.

UNIT- V

Importance of English as a vehicle of Spoken and written Communication. Close Reading Comprehension Summary Paraphrasing Analysis and Interpretation. Translation (from Indian language to English and vice-versa). Introduction to Articles of eminent Indian authors. Short Stories of eminent Indian authors.

References:

- Darer. Shankar-Communication Skills in English Language
- Dr. Uremia Rai and S.M.Rai- Business Communication
- B. K. Das- an Introduction to Professional English and Soft Skills
- Barun K. Mitra- Personality Development and Soft Skills
- Shashikumar and Dhameja-Spoken English
- Raymond Williams- English Grammar
- Wren and Martin -English Grammar and Composition
- Justin Seeley -Designing Presentation
- Laura Bergelles- Public Speaking Foundations
- M.a.K. Halliday- Spoken and Written Language
- B Balasubriamianiam-Phonetics for Indian Students
- R C Sharma- Business Correspondence
- Dowel Jones- the Handbook of English Phonetics
- Merriam Webster - Guide to Business Correspondence.
- Ashish Singh - How to Communicate Effectively

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	2		2	1	2	1	1	1	2	3		3
2	2		2	1	2	1	1	1	2	3	1	3
3	2		1	2	1	1	2	1	1	3	1	3
4	2		1	1	2	1	2	1	2	3	2	3
5	2									3		3

1BCA5 OPEN ELECTIVE-1

1BCA5(A) - Fundamentals of Computer & Information Technology

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	1/1	0	3/3	40	10	0	50

Course Objectives:

- To know computer evolution with features of each generation.
- Identify various devices used in Computer system with specific use of each.
- To know the place of computer in our day to day life, its characteristics, its usage, Limitations and benefits etc.
- To know types of software and languages with specific use of each.
- To understand Computer Network and Management Information System basics.

Course Outcomes:

- Describe Computer System evolution, Characteristics and Types.
- Select Need base System Hardware and Software .
- Classify Languages used in Computer System.
- Describe the Use, Process, Types and Topologies of Computer Communication.
- Understand the increasing role of management information system in managerial decision making with the help of computers and how information is processed, stored and utilized with example system.

Unit-wise Syllabus

UNIT – I

Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers Generations of computers, Personal Computer (PCs) – evolution of PCs, configurations of PCs- Pentium and Newer, PCs specifications and main characteristics. Basic components of a computer system - Control unit, ALU, Input/Output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

UNIT – II

Input/Output & Storage Units:-Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers & types - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers, Storage fundamentals - Primary Vs Secondary Data Storage and Retrieval methods - Sequential, Direct and Index Sequential, SIMM, Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive, flash drives Video Disk, Blue Ray Disc, SD/MMC Memory cards, Physical structure of floppy & hard disk, drive naming conventions in PC. DVD, DVD-RW.

UNIT – III

Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs-DOS Windows, Linux. Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software and its types - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them, Virus working principles, Types of viruses, virus detection and prevention.

UNIT – IV

Use of communication and IT, Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Modem - Working and characteristics, Types of network Connections - Dialup, Leased Lines, ISDN, DSL, RF, Broad band, Types of Network - LAN, WAN, MAN, Internet, VPN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN -Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways.

UNIT-V

Management information system - Introduction, Characteristics, Needs, Different views of MIS, Designing, Placement of MIS, Pitfalls in Designing an MIS, Computer based MIS – Advantages & Disadvantages. Computer Applications in Business-Need and Scope, Computer Applications in Project Management, Computer in Personnel Administration, Information System for Accounting-Cost and Budgetary Control, Marketing and Manufacturing, Computer Applications in Materials Management, Insurance and Stock-broking, Production planning and Control, Purchasing, Banking, Credit and Collection, Warehousing. Use of computers in common public services and e-governance.

References:

- Pradeep K Sinha, Priti Sinha, Computer Fundamentals, Sixth Edn. BPB Publications
- S.K.Basandra, “Computers Today “, Galgotia Publications.
- Alexis Leon & Mathews Leon, “ Fundamentals of Information technology “, Vikas Publishing House, New Delhi.
- V.Rajaraman, NeeharikaAdabala, Computer Fundamentals, PHI

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	1	1	1	3	2	3	-	1	1	3	3
2	3	2	1	2	3	2	3	3	1	1	3	3
3	3	2	1	2	3	2	3	3	1	2	3	2
4	3	1	1	1	1	1	2	-	2	2	3	2
5	3	1	1	1	1	1	1	-	1	1	2	2

1BCA5(B) - Information Technology Trends

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	1/1	0	3/3	40	10	0	50

Course Objectives:

- To make students understand E Governance and E Commerce system.
- Make them aware of crime pattern in Cyber World and basic Security Systems.
- Make them aware of basics of cellular transmission.
- To aware them with distributed system and artificial intelligent system.
- To make them aware of virtual reality and multimedia

Course Outcomes:

- Acquaint the students with the application of computers in understanding latest trends in information technology.
- Use Government initiative for citizen on E Platforms and E Commerce with security.
- Define of basics of cellular transmission systems.
- Have an Understanding of application of advances in Computer Science area AI, IOT, Cloud, Big Data, Distributed system, Virtual reality and Multimedia.
- Practice use of Google Suit effectively.

Unit-wise Syllabus

UNIT-I

E-governance, e-democracy, Government efforts to encourage citizen participation, PPP model, E-governance websites & services, MPONLINE services, UIDI & Aadhar, E-governance mobile apps like UMANG, digital locker, digital library. various site for e-governance. National E-Governance Plan (NeGP).

Introduction to cyber crime, types of attacks like Spyware, Malware, Spam Mail, Logic bombs, Denial of Service, Types of Cyber Crime : Email Fraud, Phishing, Spoofing, Hacking, Identity Theft.

UNIT-II

E-Commerce- Introductions, Concepts, Advantages and Disadvantages, Technology in E-Commerce, Benefits and Impact of E-Commerce

Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, RTGS, IMPS, NEFT, Payment Gateway, Debit & Credit Card, Internet Banking, Mobile Wallet, UPI, BHIM, PAYTM app, Online Shopping, Online Marketing.

UNIT-III

Introduction to Wireless Communication, Blue Tooth, WiFi, WiMax, LiFi, Mobile Technology, 2G, 3G, 4G, 5G services, IMEI, SIM, IP Telephony, Soft Phone, Voice Mail, Ad-hoc & Sensor Networks, GIS, ISP, Mobile Computing, Cellular System Cell, Mobile Switching Office, Hands off, Base Station. Mobile OS (Symbian/Blackberry/Windows/Android/iPhone), Features and limitations, Types of Mobile apps.

UNIT-IV

Artificial Intelligence and Expert system-Concepts of AI & Expert Systems, Merits and Demerits of Expert system, Application of Expert system and AI. Cloud Computing- Introduction, Types, Application, Services, Google Play Store, Apple Store, Need of Cloud Computing, Concept of Virtualization, Cloud Types, Cloud Services IOT- Introduction, Application & Use, Machine Learning: Introduction and Uses. Big data- Introduction, Application & Use.

UNIT-V

Introduction to Distributed system, Advantage and Disadvantage of Distributed System, Introduction to Virtual Reality and multimedia: Introduction, Brief History of Virtual Reality, Present Uses of vVrtual Reality, Various Software of Multimedia.

References:

- Fundamentals of Information Technology by Alex Leon & Mleon, Vikas Publications.
- Frontiers of Electronic Commerce, by- Kalakota, Ravi; Stone, Tom.
- E-Commerce an Indian Perspective (Second Edition) by Pt Joseph, S.J. Prentice-Hall Of India.
- Recent Magazines of Computers and Communication.
- System Analysis & Design by V K Jam, Dreamtech Press.
- Modern System Analysis & Design by A Hoffer, F George, S Valaciah, Low Priced Edn. Pearson Education.
- Information Technology & Computer Applications by V K. Kapoor, Sultan Chand & Sons, New Delhi.
- IT Trends & Technologies by Narendra Tiwari Publisher: Narendra Publication
- The Inevitable: Understanding the 12 Technological Forces That Will Shape Our Future by by Kevin Kelly Publisher: Viking
- Information Technology: Emerging Trends by Sunil V.K. Gaddam Publisher: Vitasta Publishing Pvt.Ltd

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	1	1	1	1	1	1	1	1		1	3
2	3	2	1	1	3	3	2	3	2	1	2	3
3	3	1	1	1	3	2	3	3	1	1	3	2
4	3	1	1	1	2	1	1	-	1	1	1	2
5	3	2	1	1	3	2	2	-	3	1	2	2

1BCA6Computer Lab-1

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
-	-	+0/2	+0/2	0	20	80	100

Practical List on PC Package Lab Practical on Word Processing Package

- Type the following Paragraph as given.
"My Dream career"
My ambition of life is to become a doctor. I have taken up science and hygiene as optional subjects. When I join college, I shall take up medical group. I shall appear in the P.M.T. examination to qualify for joining a Medical College. After passing the P.M.T., I shall join the medical college to become a doctor.
I would like to be a doctor. My country has become free, Government has decided to uproot the diseases from the country and improve the health of the people. Hospitals are being opened for this purpose. There is great demand for doctor. Taking all these things into consideration. I have made up mind to become a doctor.
I do not want to be clerk. This line does not suit me. I do not want to be a teacher. Law is not a paying profession these days so becoming lawyer is not my goal.
A. Correct any spelling errors displayed in the given text.
B. Save the document as <My Dream >_W01. Docx
C. Change the layout of the page as given below.
>Page size: A4 (8.27" x 11.69") >Page orientation: Landscape
D. Change the page margins as follows:
>Top: 1.25">Bottom: 1.25">Right: 1.25">Left: 1.25"
E. Format the entire document as given below. >Line spacing: 1.15" >Font: Times New Roman >Font size: 14 >Align: Justify
F. Select the heading "My Dream Career" and format it as given below. >Font color: blue >Style: Bold and underline >Align: Center
G. Change all the letters to UPPERCASE
H. Make the first letter of the paragraph larger and fall into three lines (Drop cap).
I. Format the heading "My Dream career" with Style: Heading 2.
J. Create a bulleted list for the last paragraph lines of document.
K. Enter "My Class Time Table" text as the heading of the table and format it to get the following output using a Wordart. (Font: Arial Black, Font size: 16, Align: Center)
L. Insert a footer with the following formatting options.
>Caption: <My First Document>>Font: Times New Roman >Font size: 12
- Prepare your class time table using and Format the entire table as given below.
 - Change the cell size of the table to Auto Fit to Contents. >Align: Center
 - Select the Heading row and format it as given below.
 - Convert all text in to capital letters >Style: Bold >Align: Center
 - Insert a new row just below the last row of the table and enter the following information into the new row: >Saturday: Special Lecture on Cloud computing > Merging all the column
- Send a Call Letter for All Applicants to Inform Interview Details using Mail Merge Base

Spreadsheet Practical

- Create a blank Spreadsheet in and save it as "<Your Index no>_E01".
- Create a table with 7 rows and 8 columns in the cell range A3:H9.

Insert a title "Vivekanand College " and a sub title "Mark sheet for A/L English - Class A", by centering it with the table, making the text bold, and changing the font size 16 for main title and 14 for subtitle.

3. Enter data of 6 students under the columns, "Roll No", "Name", "Physics", "Chemistry", "Biology", and "English".
4. Use the relevant formula to calculate the total marks and average and copy the formula to the relevant cells.
5. Format the "Average" column with two decimal places.
6. Use conditional formatting to change the color of the cells of which the average mark is more than 60, into green.
7. Select the columns, "Roll No", "Physics", "Chemistry", "Biology", and "English" column and draw a column chart.
8. Insert the title, "Vivekanand College ", and the sub title, "Mark sheet for A/L Biology - Class A" to the top of the chart.
9. Set the X axis labels with the index numbers.
10. Label the X axis title as, "Roll No" and Y axis title as, "Marks".
11. Label the legends for 4 subjects, "Physics", "Chemistry", "Biology" and "English".
12. Make sure to get a graph similar to the one given below.

Presentation Practical

1. Create a presentation with four blank slides.
2. Modify the presentation as follows.
3. Insert a suitable design template.
4. Insert a footer to show Your name and your Student ID.
5. Insert Today's date as a fixed date in the date area.
6. Make necessary changes to appear slide numbers in the slide number area.
7. Make necessary changes so that the footer, date and the slide number do not appear on the title slide (first slide).
8. Add content to the title slide (first slide) by following the instruction given below.
9. Type "River" as the slide title and it's format should be Font Type: Arial, Style: Bold, Size:96, Color: Black.
10. Type "Our Life Support" as the sub title and insert an image from the resources directory to a suitable location.
11. Add content to the second slide by following the instruction given below.
12. Type the slide title as, "Rivers of North India" and format it as,
13. Font Type: Arial, Style: Bold, Size: 44, Color: Black
14. Insert the following content as shown below.
The Ganga
Indus
Bamhaputra
15. Type the slide title as, "Tributaries"
16. Insert Rivers and their tributaries of slide 2 in a table.
17. Insert few more important Rivers of India with their regions.
18. Add the following animation effects to your presentation.
19. Apply emphasis animation effect to each main point and sub point in the second slide.
20. Apply sound effect when the second slide appears in the slideshow.
21. Hide the fourth slide from the slide show.
22. Save your presentation with the following file name <Rivers_of _North india>_ P01.

Practical List on Programming with C and C++

1. Write a Program in C to calculate Simple Interest when the values of Principal, Rate and Time are given.
2. Write a Program in C++ to calculate Temperature in Centigrade when temperature is in Fahrenheit.
3. Write a Program in C to determine whether an input Year is Leap Year or not.
4. Write a Program in C++ to display the Table of a number input from keyboard in the following format:
n x 1 = n
eg: 5 x 1 = 5
5 x 2 = 10
5. Write a program to calculate the Factorial of a number input from Keyboard using Recursive method.
6. Write a Program in C++ to show how to pass an Array to a user defined function.
7. Write a Program in C to swap two numbers using Call by Value and Call by Address.
8. Write a Program in C to read Name, Roll No, and Percentage of five Students and display them using Array of Structures.
9. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by the user. Assign grades according to the following criteria :
Grade A: Percentage ≥ 80
Grade B: Percentage ≥ 70 and < 80
Grade C: Percentage ≥ 60 and < 70
Grade D: Percentage ≥ 40 and < 60
Grade E: Percentage < 40
10. Write a Program in C++ to display the first n terms of Fibonacci series.
11. Write a Program in C to calculate the sum of two compatible matrices.
12. Write a Program in C++ to calculate the product of two compatible matrices.
13. Write a C program to pass an entire array to a user-defined function and multiply each element by 3 inside the function and print the elements of the array in main()
14. Write a C program to show usage of pointer to structure using arrow operators
15. Write a C program to show usage of pointer to function
16. Raising a number n to a power p is the same as multiplying n by itself p times. Write a function called power () that takes a double value for n and an int value for p, and returns the result as double value. Use a default argument of 2 for p, so that if this argument is omitted, the number will be squared. Write a main () function that gets values from the user to test this function.
17. Create a class Employee with basic information of Employees as data members and member function to get these information and display employee information.
18. Overload + operator to add two rational number.
Overload >> operator to enable input through cin.
Overload << operator to enable output through cout.
Write a main () to test all the functions in the class.
19. Consider the following class definition
class father {
protected : int age;
public;
father (int x) {age = x;}
virtual void iam()
{ cout<< I AM THE FATHER, my age is : << age<< endl;}
};
Derive the two classes son and daughter from the above class and for each, define iam() to write our similar but appropriate messages. You should also define suitable constructors for these classes.

Now, write a main () that creates objects of the three classes and then calls iam () for them. Declare pointer to father. Successively, assign addresses of objects of the two derived classes to this pointer and in each case, call iam() through the pointer to demonstrate polymorphism in action.

20. Make a class Employee with a name and salary. Make a class Manager inherits from Employee. Add an instance variable, named department, of type string. Supply a method to string that prints the manager s name, department and salary. Make a class Executive inherits from Manager. Supply a method to String that prints the string Executive followed by the information stored in the Manager super class object. Supply a test program that tests these classes and methods.

Semester - II

2BCA1-Database Management System

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- To understand need of DBMS.
- To understand conceptual and physical design of a database.
- To understand RDBMS and to design Relational database.
- To know basic database backup and recovery mechanism.
- To know advances in DBMS.

Course Outcomes:

- Understand Data, Database system and its architecture.
- Apply ER modeling and Relational Database design using Normalization.
- Apply concepts of database storage and querying.
- Understand Concurrency, Recovery and Security mechanism in DBMS.
- Understand Current advances in DBMS.

Unit-wise Syllabus

UNIT - I

Introduction To Database System : Data - Database Applications - Evolution of DB & DBMS - Need for data management, Introduction and applications of DBMS, File systems versus Database systems, Data Models, DBMS Architecture, Data Independence, Data Modeling using Entity-Relationship Model, Enhanced ER Modeling.

UNIT - II

Relational Database Concept and Design: Introduction to relational database, Structure of Relational Database, Relational model terminology domains, Attributes, Tuples, Relations, relational DB schema. Relational algebra: Basic operations selection and projection, Set Theoretic operations Union, Intersection, set difference and division, Join operations: Inner, Outer, Left outer, Right outer and full outer join. Relational Database design, Functional Dependency, definition, trivial and nontrivial FD, Normalization 1NF, 2NF, 3NF, Decomposition using FD dependency preservation, BCNF, Multi valued dependency, 4NF, Join dependency and 5NF.

UNIT - III

Database storage and querying -Basic Concepts of Indexing and Hashing Query Processing, Measures Of Query Cost, Query Processing for Select, Sort Join Operations, Basics of Query Optimization, Transformation of Relational Expression Estimating Statistics of Expression, Choice of Evaluation Plan.

UNIT - IV

Concurrency, Recovery and Security -Concurrency Control: Definition of concurrency, lost update, dirty read and incorrect summary problems due to concurrency. Concurrency Control Techniques: Overview of Locking, 2PL, Timestamp ordering, multi-versioning, validation Recovery concepts, Shadow paging, Log Based Recovery, Elementary concepts of Database security: system failure, Backup and Recovery Techniques, authorization and authentication.

UNIT - V

Introduction to Current Trends – Centralized and Client Server Architectures, Distributed Databases, Object Oriented Database, Spatial & Temporal Databases, Data Mining & Warehousing, Data Visualization, Mobile Databases, OODB & XML Databases, Multimedia & Web Databases.

References:

- Abraham Silberschatz, Henry Korth, S. Sudarshan, “Database Systems Concepts”, 7th Edition, McGraw Hill .
- Rajesh Narang “Database management System” PHI.
- Ramakrishnan and Gherke, “Database Management Systems”, TMH.
- R. Elmarsri and SB Navathe, “Fundamentals of Database Systems”, Pearson, 5th Ed.
- Singh S.K., “Database System Concepts, design and application”, Pearson Education
- Bipin Desai, “An Introduction to database Systems”, Galgotia Publications.

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	2	2	2	1	1	1	1	1	2	2
2	3	3	3	3	2	2	1	1	1	1	1	2
3	3	3	3	2	2	1	2	2	2	1	1	2
4	3	3	2	2	1	1	2	1	2	1	2	2
5	3	3	3	1	2	1	2	1	2	1	2	2

2BCA2-Data Structures

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- Understand the concepts of data structures and algorithm design methods.
- Choose the appropriate data structure such as arrays, linked lists, stacks, queues, hash tables, trees, heaps and graphs and writing programs for these solutions.
- Solve problems of Searching and Sorting.
- Understand the complexity of algorithm.

Course Outcomes:

- Understand the concept and usage of data types, dynamic memory management and data structures.
- Understand various data structures like arrays, linked lists, stacks, queues, hash tables, trees, heaps and graphs.
- Apply algorithms for Searching and Sorting Methods.
- Develop and analyze Algorithms and calculate their Complexities.
- Understand the applications of various data structures.

Unit-wise Syllabus

UNIT – I

The concept of data structure, abstract data type, concept of list & array, introduction to stack, stack as an abstract data type, primitive operation on stack, stack's application - infix, postfix, prefix and recursion. Introduction to queues, primitive operations on queues, queue as an abstract data type, circular queue, dequeue, priority queue, applications of queue.

UNIT – II

Linked list - introduction to linked list, memory representation of linked list, operations on linked list, linked list representation of stack and queue, header nodes, Types of linked list - doubly linked list, circular linked list, application of linked list.

UNIT –III

Trees - basic terminology of trees, binary trees, tree representations as array & linked list. Binary tree representation. Traversal of binary trees - inorder, preorder & postorder, application of binary tree, threaded binary tree, height balanced tree, b-tree.

UNIT-IV

Analysis of algorithm, complexity with big 'O' notation, Searching - sequential search, binary search and their comparison, Sorting - external & internal, sorting algorithm - Insertion, Selection, Quick, Bubble, and Heap, comparison of sorting methods.

UNIT-V

Graphs- Introduction to graphs, basic terminology, directed, undirected & weighted graph, representation of graphs, graph traversals, Spanning trees, minimum spanning tree, applications of graphs: shortest path problem using Dijkstra method.

References:

- Lipschuists, "Data Structure", Schaum 'S Outline Series, Mcgraw Hill Publication
- Ellis Horowitz AndSartajSawhney, "Fundamentals of Computer Algorithm"
- Trembley&Sorrenson, "Data Structure"
- S. Sawhnev&E. Horowitz, "Fundamentals of Data Structure"
- Aaron M. Tenenbaum, Moshe J. Augenstein, YedidyahLangsam, "Data Structures Using C and C++", PHI.

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	2	2	2					1		1
2	3	3	3	2	2							1
3	1	3	3	2	1							
4	3	3	2	3							1	1

2BCA3-Computer Networks

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
5/5	1/1	0	6/6	80	20	0	100

Course Objectives:

- Build an understanding of the fundamental concepts of computer networking.
- Familiarize the student with the basic taxonomy and terminology of the computer networking.
- Preparing the student for entry in advanced courses of computer networking.
- To gain knowledge of various protocols for network design and maintenance.

Course Outcomes:

- Understand and explain Data Communications System and its components.
- Understand Computer Network basics and OSI and TCP/IP model.
- Understand Networks switching, error detection and error correction techniques.
- Identify the different types of network devices and their functions.
- Familiarity with the various protocols of computer networks

Unit-wise Syllabus

UNIT-I

Basic concepts: network definition, components of data communication, distributed processing, topology, transmission mode, categories of networks. OSI and TCP/IP models: layers and their functions, comparison of models. Digital transmission: modems, modems, cable modems. Analog and digital signal; data-rate and limits; digital to digital line encoding schemes; parallel and serial transmission; modulation scheme, multiplexing techniques FDM, TDM, transmission media.

UNIT-II

Networks switching techniques and access mechanisms, circuit switching; packet switching, message switching, connection-oriented virtual circuit switching; dial-up modems; digital subscriber, data link layer functions and protocol, error detection and error correction techniques, data-link control framing and flow control, error recovery protocols - stop and wait ARQ, go-back-n ARQ; point to point protocol.

UNIT-III

Multiple access protocol and networks, ALOHA, SLOTTED ALOHA, CSMA/CD, protocols; Ethernet LANS, Token Ring, Token Bus, back-bone networks, network adapters cards, repeaters, hubs, switches, bridges, types of bridges, router and gateways.

UNIT-IV

Networks layer functions and protocols, routing: routing algorithms distance vector routing; shortest path routing, network layer protocol, IP protocol, internet control protocols, Unicasting, multicasting, broadcasting, ISDN: services, historical outline, PRI, BRI.

UNIT-V

Transport layer functions and protocols, overview of TCP and UDP, transport services error and flow control, connection establishment and release, three way handshake, overview of session layer and presentation layer, overview of application layer protocol overview of DNS protocol, overview of internet, WWW,HTTP, FTP, SNMP protocol. Internet services, email services, www services, search service etc.

References:

- B. A. Forouzan: Data Communications and Networking, Fourth edition, THM,
- A.S. Tanenbaum: Computer Networks, Fourth edition PHI.
- Ames Chews Charles Perkins, Matthew Strebe "Networking Essentials: Study Guide "MCSE BPB Publications.
- K.Basandra& S. Jaiswal "Local Area Network" Galgotia Publications
- William Stalling "Data and Computer Communication" Pearson Prentice Hall
- Prakash C Gupta " Data Communication and Computer Network " PHI

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	2	2	2					2	1	1
2	3	2	1					2		2	1	1
3	3	2	2	2	2			1		2	1	1
4	3	2	2	2	2			1		1		1

2BCA4- Environmental Science

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	1/1	0	3/3	40	10	0	50

Course Objectives:

- Build an understanding of the fundamental concepts of Environmental studies.
- Capability to identify relevant environmental issues, analyses the various underlying causes.
- Allow the student to gain knowledge of Ecosystem.
- Introduce the student various causes and effect of Environmental Pollution.

Course Outcomes:

- Student will able to understand nature.
- Student will sensible about surrounding nature.
- Student will understand the value clear and polluted nature.
- Student will understand various energy resources renewable and non-renewable energy sources.

Unit-wise Syllabus

UNIT-I

The Multidisciplinary nature of environmental studies and Natural resources. Definition; Scope and importance, Need for public awareness. Natural resources and associated problems. Forest resources: Use and Over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies.

Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT-II

Ecosystems, Biodiversity and its Conservation. Concept, structure and function of an ecosystem, producers, consumers and decomposers, energy flow in the ecosystem, ecological succession, food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem: - Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). Biodiversity introduction-Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, biodiversity at global, national and local levels, India as a mega-diversity nation, Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT-III

Environmental Pollution. Definitions. Causes, effects and control measures of:

- (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution
(e) Noise pollution (f) Thermal pollution (g) Nuclear hazards.

Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster management: floods, earthquake, cyclone and landslides.

UNIT-IV

Social Issues and the Environment. From Unsustainable to Sustainable development. Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Case studies. Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. Wasteland reclamation, Consumerism and waste products. Environment Protection Act- Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act.- Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public awareness.

UNIT-V

Human Population and the Environment. Population growth, variation among nations. Population explosion- Family welfare Programme. Environment and human health, Human Rights, Value Education, HIV/AIDS, Women and Child Welfare. Role of information Technology in Environment and human health, Case Studies.

Field Work (Practical)

Visit to a local area to document environmental assets- river/forest/grassland/hill/mountain.

Visit to a local polluted site- Urban/Rural/Industrial/Agricultural.

Study of common plants, insects, birds.

Study of simple ecosystems-pond, river, hill slopes, etc.

References:

- Environmental Studies For Undergraduate Courses - UGC e-Text book by Erach Bharucha available at <http://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf>

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	2	2	2	3	3	2	3	2	1	1
2	3	2	1	3	3	3	2	1	2	2	1	1
3	3	2	2	2	3	2	2	3	2	2	1	1
4	3	2	2	2	3	3	2	2	2	1		1

2BCA5Open Elective-2

2BCA5(A)Computer Hardware and Troubleshooting

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	0	1/1	3/3	40	10	0	50

Course Objectives:

- To develop skills in installation and configuration of Operating systems,
- Identify faults, troubleshoot, repair and do preventive maintenance of computer system and its peripherals.
- To understand the various hardware device and configuration.
- Develop ability to repair and maintain computer system

Course Outcomes:

- Understand hardware components in computer system.
- Install, configure Operating Systems and device drivers.
- Install, configure and maintain various components in computer system and peripheral devices.
- Diagnose faults, repair and maintain computer system and its peripherals.

Unit-wise Syllabus

UNIT – I

Inside the PC: Core Components, Identify different type and generation of computer, Identify devices required for using laptops, Identify components which makes the system and specify its importance. Identify various types of ports and its connecting devices.

Motherboard: definition, Components/connections in motherboard, functional block diagram
Central Processing Unit (CPU): CPU Speeds, Word Size, Data Path, Internal Cache memory, Slots and sockets, CISC vs RISC processor, CPU chips preprocessors motherboard Types/Form Factors (AT, Baby AT, ATX, LPX, NLX, BTX)

Expansion Buses (Definition, Bus Architecture (PC/PC-XT, PC-AT/ISA, EISA, MCA, VESA Local (VL) Bus, PCI, Combination of Bus Systems, AGP – Accelerated Graphics Port, Universal Serial Bus (USB), IEEE 1394 Fire Wire- A Bus Standard

System Controller: Definition, Basic Input Output System:Services, Bios Interaction, CMOS-RAM

Chipsets : Definition, Advantage, North and South Bridge

System Memory : definition, memory sizes, speeds and shapes (DIP, ZIP, SIPP, SIMM, DIMM, RIMM), Memory modules (Dynamic RAM, SDRAM, DDR SDRAM, SLDRAM, DRDRAM, Fast Page Mode (FPM) DRAM, Extended Data Out(EDO) DRAM)

UNIT– II

Hard Disk Drive and Controller, DVD Drives, Disk Basics, Hard Disk Interfaces: EIDE, Serial ATA, SCSI, USB and IEEE 1394 (Firewire), RAID, Solid State Drive (laptop), Disk Geometry : Heads, Tracks, Sectors, Cylinders, Cluster, Landing zone, MBR, Zone bit recording, Disk performance Characteristics: Seeks and Latency, Data Transfer Rate,Hard Disk Controller: Functional Blocks, HDC Functions, DVD Drives : Types, Recording, Construction, Interfacing, DVD Drive Performance Criteria : Data Transfer Rate, Access time, Cache/buffer, Blu-ray disk specification

UNIT– III

Input Devices and Printers, Keyboard : Keyboard operation, Keyboard Types, Types of Key switches (Membrane, mechanical, rubber dome, capacitive) Keyboard interfaces, Mouse : Types, Operation, Interfaces, Scanner : Scanner Types, Image quality measurement, Types of Printers, Printer Interfaces, Ink-jet Printer : Parts, working principle, LaserJet Printer : Parts, working principle.

UNIT– IV

Monitor and Display Adapters Video Basics (CRT parameters), VGA monitors, Digital Display Technology- Thin Displays, Liquid Crystal Displays, Plasma Displays, Light Emitting Displays, Graphics Cards : Components of a card, Accelerated Video cards, CGA, EGA, VGA.

UNIT– V

Trouble Shooting and Preventive Maintenance, POST: Functions, IPL Hardware, Test Sequence, Error messages, Troubleshooting: possible problems and diagnosis in Motherboard, Keyboard, Hard Disk Drive, Printer, Preventive maintenance tools

References:

- Computer Installation and Servicing, D Balasubramanian, Tata McGraw Hill Education Private Limited
- The complete PC Upgrade & Maintenance Guide, Mark Minasi, BPB Publications
- IBM PC and clones, GovindRajalu, Tata McGraw Hill Education Private Limited

LIST OF EXERCISES AND PRACTICALS

Identify basic components of a personal computer.

Prepare a list of various computer peripherals. (e.g. CPU, Monitor, Keyboard, Mouse, Speaker, Web cam, Printer, Scanner, microphone, speakers, modem, projector etc).

Identify common ports, associated cables, and their connectors.

Observe various connectors, ports back and front side of the computer. Write their purpose and specifications. (e.g. Power, PS/2 keyboard and mouse, Serial and parallel, USB, VGA, LAN, Audio & microphone, Firewire, HDMI, games, SATA etc.)

Identify major components including motherboards, memory, drives, peripheral cards and devices, BIOS, and Windows operating system.

Observe the various components on the motherboard, identify it. Also observe their interconnection and arrangement inside the case. Detach and attach the cables and component in the PC case and motherboard. Carryout detailed study on all the components and devices on the given motherboard.

Processor socket, Chipsets,

Memory module slots, BIOS, CMOS

FDD, HDD connectors

Different types of expansion slots (ISA, EISA, PCI, PCI express, AGP, Express Card & PC Card (or PCMCIA) etc.)

Add-on-cards (audio, graphics, I/O, TV tuner, network etc.)

Cables in a computer system (IDE Ribbon cable, SATA cable etc)

Connections for button, indicator lights etc.

Observe various types of memory modules (SIMM, DIMM, SO-DIMM, RIMM, SO-RIMM). Also observe impact of removal of memory modules from the system, start it and re insert memory module and restart system.

Disassemble the PC carefully. Assemble the same PC you have disassembled and boot the system. Observe the procedure of assembling a computer system.

Observe the different types of motherboards, form factors and write the difference between the desktop motherboard and laptop motherboard (e.g Full size AT, baby AT, ATX, LPX, NLXetc).

Add additional facilities like the network capabilities, and gaming capabilities by adding an Accelerator card. Install the given driver and test the computer for proper functioning. Remove the drivers for some devices like sound, display, network etc. and again install them and check the proper functioning of computer.

Upgrade the given PC by adding RAM and additional Hard Disk.

Observe, search and write the specifications of CD/DVD drive, HDD, motherboard, RAM chips, Power supply, Microprocessor chip, Add on cards. Prepare complete specifications of the latest system configuration available in the market.

Observe the power supply (SMPS) and measure their voltage levels of a given SMPS. Measure various voltage levels, such as motherboard, storage devices and fan etc. using multi-meter. Do a detailed study on all the components and devices on the given power supply. Observe different types of switch mode Power Supply – AT, ATX, NLX . Record the different types of power connectors on the motherboard.

Observe various secondary storage systems- Hard Disk, Flash drives, CD/ DVD drive. Open drives and draw the internal structure of them.

Observe the various techniques for low level and high level formatting of Hard Disk. Format the given Hard Disk using any one technique and create three partitions, two for operation systems and one for data.

Observe the procedure for installing Operating System like win7/win8 with partition formatted in previous practical in one partition, (fat, fat16, fat32, ntfs, gpt). Try booting PC.

Learn the content of boot.ini after the installation process. Now install unix Operating System like Linux /Ubuntu/ centos/ fedora/ red hat in another partition. Create dual booting system try booting PC. Learn the content of boot.ini after the installation process.

Open at least 2 to 3 different types of keyboard and mouse and observe the internal circuits. Observe and write steps to troubleshoot, maintain and clean the diskette drives, keyboard, mouse, etc.

Observe different types of printers (dot matrix, inkjet & laser, multifunction). Install driver and interface the printers with PC/Laptop on any operating system (connect the printer to one PC directly using USB/Serial/Parallel ports as per the availability; test the functioning of the printer.) Write detailed comparative analysis of different types of printer available in the market and suggest a printer with good features and best price as per need. Justify your printer selection.

Observe the interfacing, installation and working of various devices such as scanner, projector, web cam etc. Connect all these devices with the given PC, install & test them.

Identify how to disable unused devices to decrease Security risks.

Change booting of computer with different secondary storage CD, HDD, USB etc.

Identify the problem in the given PC, using the given troubleshooting sequence, fix the issue, record the given problem, and produce proper documentation of your work

Recognize common symptoms associated with diagnosing and troubleshooting PCs and utilize Windows built-in diagnostic tools.

Identify general troubleshooting techniques and strategies

Utilize scandisk, control panel, boot-up menu, and startup disk as diagnostic tools.

Access Microsoft Knowledge Base on the Internet to solve common problems.

Identify the common problems associated with shutdown, configuration, and cabling.

Identify problems associated with heating and cooling of the internal components.

Identify problems with installing internal devices such as hard drive, tape drives, or CD-ROM drive.

Recognize and interpret the meaning of common error codes and startup messages.

Recognize windows-specific printing problems and corrections.

Log boot ups and events.

Perform hard drive file system maintenance.

Identify anti-virus software and applications.

Utilize Internet to download device drivers: Installation of drivers of various devices from the internet.

Demonstrate to remove unwanted software applications.

Operate and maintain registry file.

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	1	1	2	2	1			2		1
2	2	1	2	2	2			1	1	1	3	1
3	2	1	1	2	1	1	1		3	2	1	1
4	3	2	2	1		1	1	2	1	1		1

2BCA5(B)–Working with Operating Systems (DOS, Windows & Linux)

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	0	1/1	3/3	40	10	0	50

Course Objectives:

- To know the characteristics of various operating systems and applications.
- Understand various functions of operating systems
- Understand and use various tools and setting of operating systems.
- Understand and use commands of DOS, Windows and Linux

Course Outcomes:

- Gain knowledge of various types of operating systems
- Able to use various commands of different OS.
- Able to do various font and device installation.
- Gain knowledge of Process fundamentals and editor in Linux.

Unit-wise Syllabus

UNIT - I

Fundamentals of operating system, definition and need. Main services of operating system, various types of operating system, (definition and characteristics), multitasking, multiprocessing, multiprogramming, real time, time sharing, parallel, network operating system, booting process, file system.

Disk Operating Systems (DOS) - introduction, history & versions of DOS. DOS basics-physical structure of disk, drive name, fat, file & directory structure and naming rules, booting process, dos system files.

DOS commands: internal - DIR, MD, CD, RD, COPY, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE etc.

External commands - CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS etc.

UNIT - II

WINDOWS - introduction to windows, its various versions and features. Hardware requirements for various versions of windows. Working with windows (windows 10 or latest version) windows concepts, windows structure, desktop, taskbar, start menu, working with files and folders, create, copy, delete, renaming and moving files and folders, working with recycle bin-restoring deleted files, emptying the recycle bin, searching files and folders .my computer, formatting floppy disks, using cdrom disk and drives.

Using windows accessories programs- calculator, notepad, paint, wordpad, character map, paint, command line.

Using media player, sound recorder, volume control. Taking printout from programs, printer properties, add fonts to windows (specially adding hindi fonts and using them). Setting up regional and language settings in windows. Advanced features of Windows -Managing Hardware & Software – Add or remove Hardware devices to/from computer, Add/remove programs, Using Scanner, Web camera, sharing of printers.

UNIT - III

System tools - backup, clipboard viewer, disk defragmenter, drive space, scandisk, system information windows update.

Communication – setting up dial up networking with windows, internet connection with windows, direct cable connection, setting up tcp/ip properties, hyper terminal, phone dial, browsing the web with internet explorer, communication through outlook express, multiple users features of windows. Creating and deleting user, changing user password etc. Accessibility features of windows.-sharing information between programs, sharing folders and drives browsing the entire network, mapping windows shared drives, using shared printers - understanding ole - embed/link using cut and paste and embed/link using insert object - manage embedded/linked object.

UNIT - IV

Linux - Linux introduction, basic features, advantages, installing requirement, basic architecture of Unix/Linux system, kernel, shell, Linux file system-boot block, super block, inode table, data blocks, Linux standard directories. Partitioning the hard drive for Linux, installing the Linux system, system, startup and shut-down process, init and run levels.

Essential linux commands understanding shells, commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp&comm, view files, disk related commands, checking disk free spaces.

UNIT - V

Process fundamentals, connecting processes with pipes, tee, redirecting input output, manual help, background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron, batch commands, kill, ps, who, sleep, printing commands, find, sort, touch, file, file related commands-ws, sat, cut, dd, etc. Mathematical commands- bc, expr, factor, units, creating and editing files with vi, joe& vim editor.

References:

- Microsoft Windows Operating System Essentials (Essentials (John Wiley)) by Tom Carpenter Publisher: Sybex
- Linux Bible by Christopher Negus Publisher: Wiley
- The Best Book of Ms-DOS5 by Alan Simpson, Alan Simpson Page Publisher: Sams Publishing

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	1	1	2	2	1			2		1
2	2	1		2				1	1	1	2	1
3	2	1	1	2	1	1	1		2	2	1	1
4	3	2	2	1		1	1	2	1	1		1

2BCA6 - Computer Lab-2

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
-	-	+0/2	+0/2	0	20	80	100

Practical List on DBMS

1. Draw an ER diagram to University Database.
2. Draw an ER diagram to Library management System.
3. Create a Library management Schema/ database and search anomalies in it.
4. Assume a video library maintains a database of movies rented out. Without any normalization, all information is stored in one table as shown below.
 - a. Normalize the following Schema with given Constraints.
 - b. books(accessionno, isbn, title, author, publisher)
 - c. users(userid, name, deptid, deptname)
 - d. accessionno -> isbn
 - e. isbn -> title
 - f. isbn -> publisher
 - g. isbn -> title
 - h. userid -> name,
 - i. userid -> deptid
 - j. deptid -> department

5. Compare 3NF and BCNF with appropriate example.
6. Give exercise on DDL and DML .
7. Create a database named “school.mdb” and perform the following tasks using MS Access or My SQL
8. Create a table named “studentinfo” having following table structure.

Field Name	Data Type	Structure
Class	Number	
Section	Text	
Roll No.	Number	
Name	Text	40 Characters Long
Status	LookUp Wizard	Two Value: Senior and Junior
Photo	OLE Object	Photos of Student
DOB	Date/Time	Date of Birth Of students
Remarks	Memo	

9. Fill atleast 5 records.

Prepare a query to display all records and Name should be in ascending order.

Prepare a query named “senior” to display records including fields name, class, sec, rollno, status, photo and value of “status” field must be senior.

Prepare a form of above query “senior”.

Prepare a report of all the fields of above table.
10. Create a database named “library.mdb” and perform the following tasks:
11. Create a table named “Book” having following structure:

Field Name	Data Type
Bookid	Text
BName	Text
WName	Text
PYear	Date/Time
PName	Text
Price	Currency

Add at least 5 records.

Prepare a query to display only records including book name, writer name and publication name. Save the query as "q_book".
Prepare a query to display all records on the basis of price which is more than Rs500.
Prepare a form on the basis of table.
Prepare a report on the basis of query named "q_book".

Practical List on Data Structures

1. Program to maintain a Linked List.
2. Program to add a new node to the ascending order Linked List.
3. Program to maintain a Doubly Linked List.
4. Program to implement Stack as an Array.
5. Program to implement Stack as a Linked List.
6. Program to convert an A.E. from Infix form to Postfix form.
7. Program to evaluate an Expression entered in Postfix form.
8. Program to Implement Non-Recursive function for Factorial of a Number.
9. Program to Implement Recursive function for Factorial of a Number.
10. Program to implement a Queue as an Array.
11. Program to implement a Queue as a Linked List.
12. Program to implement a Circular Queue as an Array.
13. Program to implement a Circular Queue as a Linked List.
14. Program to implement a Deque using an Array.
15. Program to implement Linear Search in an unsorted Array.
16. Program to implement Binary Search in a sorted Array.
17. Program to implement Selection Sort.
18. Program to implement Insertion Sort (The program should report the number of comparisons).
19. Program to implement Bubble Sort.
20. Program to implement Quick Sort.

Semester - III

3BCA1 - Web Designing (HTML, CSS, Java Script)

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- Learn how to design and develop a web page using HTML and CSS.
- Design and develop a web site using text, images, links, lists, and tables for navigation and layout.
- Style your page using CSS.
- Learn how to use database in web design.

Course Outcomes:

- Describe the concepts of WWW including browser and http protocol.
- List the various HTML tags and use them to develop the user friendly web pages.
- Define the CSS with its types and use them to provide the styles to the web pages at various levels.
- Develop the modern web pages using the html and CSS features with different layouts as per need of applications.

Unit-wise Syllabus

UNIT-I

Introduction to HTTP, HTML, Basic HTML Tags, Body Tags, Coding Style, Modifying & formatting Text, Lists – Unordered, Ordered, Definition, Insert Links -Linking to another Document, Internal Links, Email Links, Relative and Absolute Links, Insert Images - Referencing Images, Clickable Images, Image Placement and Alignment, Image Size, Image Margins, Image Formats, Image Maps- Defining an Image Map, Advanced Coloring Body Content, Working with tables - Basic Tables, Table Attributes, Table Cell Attributes, Table Row Attributes, Tables Inside of Tables, Invisible Spacers, Working with Frame-Based Pages- Creating Windows, Single Window Frames, Creating Column Frames, Creating Row Frames, Creating Complex Frames.

UNIT-II

Cascading Style Sheet (CSS) – Introduction, creating style, using inline and external CSS, Creating Divs with ID style, Creating Tag& Class style, creating borders, Navigation links, creating effects with CSS.

JavaScript – Introduction, use of JavaScript in web pages. Understand JavaScript event model, use some basic event and control webpage behavior. Variable declaration, Operators, , Control Statements, Error Handling, Understanding arrays, Function Declaration, Built In Functions, Standard Date and Time Functions, Working with Objects, Call method in JavaScript.

UNIT-III

Designing websites with Dreamweaver/expression Web/AMAYA/COFEE CUP WYSIWYG HTML Editor - Introduction to WYSIWYG HTML editor, advantages of using HTML editors, creating a new site, creating a new page, adding images with alternate text, inserting & formatting text, aligning images, creating an email link, linking to other websites, testing & targeting links, organizing files & folders

Creating & Inserting Images - Optimizing Images for the Web, saving GIFs & PNGs in Photoshop, inserting GIFs, adjusting transparency settings, saving JPGs for the Web

UNIT-IV

Designing accessible tables - understanding tables & accessibility, using tables for tabular data, styling a table, editing table layouts, adding style to a table using CSS

Creating websites with frames - introducing frames, creating a frameset, opening pages into frames, controlling scrollbars & borders, targeting links in frames

UNIT-V

Web hosting - what is domain? Introduction to DNS, how to register a domain ?, what is web hosting ?, how to get a web hosting ?, host your website on web server.

FTP - FTP introduction, FTP commands viewing files and directories, FTP commands transfer and rename files, FTP with WS FTP/ CuteFTP, Filezilla on Windows.

References:

- HTML and CSS, Jon Duckett, John Wiley, 2012
- Achyut S Godbole and AtulKahate, “Web Technologies”, Tata McGraw Hill
- Gopalan N P, Akilandeswari “Web Technology: a Developer S Perspective”, PHI
- H.M. Deitel, P.J. Deitel, a.B. Goldberg-Internet & World Wide Web How to Program, Pearson Education, 3rd Edition,
- C. Xavier, “Web Technology &Design ”, Tata McGraw Hill.
- Ivan Bay Ross, “HTML,DHTML,JavaScript,Perl CGI”, BPB.
- Web Technologies, Black Book, Dreamtech Press
- HTML 5, Black Book, Dreamtech Press
- Joel Sklar -Web Design,, Cengage Learning
- Harwani-Developing Web Applications in PHP and Ajax, Mcgrawhill
- Learn HTML IN A Weekend By Steven E. Callihan, PHI

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	1	1	1	2	1		1	1	1	1	1
2	3	2	2	2	3	2	1		1	1	1	1
3	2	2	2	2	3	2	1	1	1	1		1
4	3	2	3	2	2	2		1	1	1	1	1

3BCA2 - Operating Systems

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
5/5	1/1	0	6/6	80	20	0	100

Course Objectives:

- To understand the services provided by operating system
- To understand the working and organization of process and its scheduling and synchronization.
- To understand different approaches of memory management techniques.
- To understand the structure and organization of the file system.

Course Outcomes:

- Understand, identify and describe the services provided by operating systems.
- Understand and solve problems involving process control, mutual exclusion, synchronization and deadlock.
- Implement processor scheduling, synchronization and disk allocation algorithms for a given scenario.
- Understand different types of operating system.

Unit-wise Syllabus

UNIT-I

Operating Systems - Definitions, functions, Types of operating system - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, components, Operating system Services, System Calls, programs, System structure.

UNIT –II

Process management - process concepts, process state & process control block, process scheduling, scheduling criteria, scheduling algorithms, multiple processor scheduling, real-time scheduling, threads,

UNIT –III

Critical section problem, semaphores, classical problem of synchronization,, deadlock characterizations, method for handling deadlocks, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock .

UNIT –IV

Memory management - logical versus physical address space, contiguous allocation, fixed partition, variable partition, swapping, paging, segmentation, virtual memory, demand paging, page replacement, page replacement algorithms

UNIT –V

Disk scheduling, disk management, swap space management, disk reliability, stable storage implementation. File concepts, directory structure, protection.

References:

- Operating system concepts by Silberschatz, Galvin, Gagne, Wiley Student Edition
- Operating system concepts & design by Milan Milenkovic, TMH publication

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3				2			1	1	1	1	1
2	3	2	1	1	1	1	1				1	
3	3	2	3	3	2		1	1	1			1
4	2	2	3	2	2			1	1		1	

3BCA3 (A) -Linux Server Administration

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- Understand fundamental concepts of Linux server administration,
- Will be able to put those concepts to use in real-world situations.
- Understand how to install and customize Linux
- Manage users, permissions, folders, and native applications;
- Configure Internet and intranet services (understanding and managing the Linux TCP/IP networking stack and services);
- Creating and maintaining print, e-mail, FTP, and web servers.

Course Outcomes:

- Write shell program for simple problem
- Use of basic commands of Linux.
- Analyze the need for security measures for Linux sever.
- Managing user account in Linux.
- Install and configure Email Sever, DNS, FTP etc.

Unit-wise Syllabus

UNIT – I

Linux introduction and file system - basic features, different flavors of Linux. Advantages, how Linux access files, storage files, Linux standard directories. Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp&comm, view files, disk related commands, checking disk free spaces.

UNIT-II

Understanding shells, Processes in Linux, connecting processes with pipes, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron commands, kill, ps, who, sleep, Printing commands, touch, file related commands - wc, cut, dd, etc. Mathematical commands- bc, expr. Creating and editing files with vi& vim editor. Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Filter using regular expressions – grep, egrep, and sed.

UNIT-III

Introduction to shell programming-develop some shell programs.

System administration: common administrative tasks, configuration and log files, role of system administrator.Installing requirement, partitioning the hard drive for Linux, installing the Linux system, system startup and shut-down process.

UNIT-IV

Managing user accounts-adding & deleting users, changing permissions and ownerships, creating and managing groups, modifying group attributes, temporary disable user's accounts, creating and mounting file system, file security & permissions, becoming super user using su. Host name, disk partitions & sizes, users, kernel. Backup and restore files, installing and removing packages.

Starting & using KDE &GNOMEgraphical interfaces.

Basic networking administration: setting up a LAN using LINUX, choosing peer to peer vs client/server model, setting up an Ethernet LAN, configuring host computers, checking Ethernet connecting, connecting to internet, common networking administrative tasks, configuring Ethernet, initializing Ethernet interface, ifconfig, netstat and netconfig commands, TCP/IP network, DNS services.

UNIT-V

Installation, configuration & Administration of following servers in Linux

- Mail server
- DNS
- Remote access
- FTP server
- Apache web server
- VNC Server

References:

- Fedora 9 And Red Hat Enterprise Linux Bible by Christopher Negus, Wiley India Ltd.
- **Linux Bible, 9ed**, by Christopher Negus, Wiley India Ltd
- Linux Administration, by Kogent Learning Solutions Inc., ISBN 13- 9789350044209, ISBN 10-935004420X, Wiley India
- Unix & Shell Programming by Forouzan, Cengage Publications

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	1	2	1	1		1	1	1	1	1
2	3	2	2	2		1	1				1	
3	3	2	1	2	1		1	1		1		1
4	3	3	2	1	1	1			1		1	
5	3	3	3	2	1	1		1	1	1		1

3BCA3(B) - Multimedia and Animation

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- To provide students with a basic understanding of multimedia systems and its components.
- This course focuses on topics in multimedia information representation and multimedia standards in the components of multimedia – text, audio, image, video and animation.
- To provide information about the standards tools and techniques used in development of multimedia components for productions
- To create simple multimedia applications and products for using standalone, networked or web based computers.

Course Outcomes:

- Develop understanding of technical aspect of multimedia systems.
- Understand and explain the storage mechanism and applicability of various file formats for audio, video and text media.
- Develop various multimedia systems applicable in real time.
- Create a multimedia component using various tools and techniques.
- Apply the guidelines and standards of multimedia systems and to analyze the performance of multimedia system.

Unit-wise Syllabus

UNIT-I

Introduction to multimedia, needs and areas of use, development platforms for multimedia identifying multimedia elements text, images, sound, animation and video, making simple multimedia with PowerPoint.

Concepts of plain & formatted text, RTF& HTML texts, using common text preparation tools, conversion to and from of various text formats, using standard software, object linking and embedding concept.

UNIT-II

Sound - sound and its attributes, sound and its effects in multimedia, frequency, sound depth, channels and its effects on quality and storage, size estimation of space of a sound file, sound card standard – FM synthesis cards, waves table cards, MIDI and MP3 Files and Devices, 3D Sounds, recording and editing sound using sound editors like audacity, sound forge etc.

Importance of images graphics in multimedia, vector and raster graphics, regular graphics vs. Interlaced graphics, image capturing methods - scanner, digital camera etc. Color models- RGB, CYMK, HUE, Saturation, and Brightness, Various Attributes of Images Size, Color, Depth etc, Various Image File Format BMP, DIB, CIF, PIC, and TIF format their features and limitations, image format conversion, various effects on images. create images using Photoshop, CorelDraw and apply various effects, using layers, channels and masks in images.

UNIT-III

Video- Basic of Video, Analog and Digital Video Type of Video, Digitization of Analog Video, Video Standard – NTSC, PAL, HDTV, Video Capturing Media /Instruments Videodisk Camcorder Compression Techniques, File Formats AVI, JPG, MPEG, Video Editing and Movie Making Tools, Converting Formats of Videos, Recording and Editing Videos Using Video Editing Software Like Adobe Premiere or Sony Vegas.

UNIT-IV

Animation and its basic – principals of animation and its use in multimedia, computer system configuration and peripherals requirements, software for animation, effects of resolution, pixel depth, image size, on quality and storage, types of animation and applications.

Authoring tools for multimedia – introduction to various types of multimedia authoring tools, CD/DVD based and web based tools, features and limitations, creating multimedia package using all components.

UNIT-V

Introduction to virtual reality and its applications, virtual reality terminology head mounts display (HMD), boom, cave, input devices and sensual technology, characteristic immersive vs. shared, augmented and mixed reality.

References:

- Ramesh Bangia-Introduction to Multimedia- Laxmi Publications Pvt. Ltd.
- Tay Vaughan-Multimedia: Making It Work,TataMc-Graw Hill.
- Bhatnager G. Elsevie-,Introduction to Multimedia Systems,
- Satish Jain O Level Introduction to Multimedia (M4.2-R4), BPB Publications.

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	2	1	1	2	1	1		1	1	1
2	3	3	2	1	1	1			1	1	1	1
3	3	3	3	2	2	2		1		1		1
4	3	3	3	1	3	2		1	1	1		1
5	3	3	3	2	2	2	1	1	1	1	1	

3BCA4 - RDBMS using MYSQL

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	0	1/2	3/3	40	10	0	50

Course Objectives:

- Establish a basic understanding of the analysis and design of a database.
- Establish a basic understanding of the process of database development and administration using SQL.
- Enhance Programming and Software Engineering skills and techniques using SQL.
- Establish a basic understanding of background materials needed for technical support using SQL.

Course Outcomes:

- Understand and describe the basic concepts and terminology of Database Management System.
- Understand and design simple ER model
- Write query for simple problem.
- Understand and Describe the Basic Concepts MySQL.

Unit-wise Syllabus

UNIT - I

Introduction to MySQL, Installing MySQL - MySQL Installation, windows installation, Linux RPM Installation, Linux Binary Installation, Source Installation

Starting and stopping MySQL - four different methods to start MySQL in Linux, MySQL stopping, Basic MySQL Queries, DML Queries, DDL Queries, TCL Queries, Types of Joins, Unions

Various logs in MySQL and its uses- MySQL logs, error Log, Query Log, slow Query Log, binlog and its format, relay log.

UNIT - II

MySQL client Programs - MySQL Server/Client Architecture, MySQL Client Programs, MySQL Commands, MySQL Non-Client Programs, Upgrading MySQL, Why up-gradation?, Checklist MySQL up-gradation

Mysqldadmin commands- MySQL Admin Commands, Workbench MySQL

Locking in MySQL- Locking in MySQL, Internal Locking, Table level Locking, Row level Locking, External Locking, Dead Lock.

UNIT - III

MySQL Table maintenance - Table Maintenance, Analyze Table, Backup Table, Check Table, Checksum Table, Optimize Table, Repair Table, Restore Table, Moving Tablespace
Information schema and performance schema - MySQL Information schema, Tables in Information schema, MySQL Performance schema

MSQL backup and Recovery- MySQL Backup, MySQL Backup Types, MySQL backup factors, MySQL Backup Tools, MySQL Dump, MySQL Recovery, MySQL Recovery Factors, Load data infile& select into outfile.

UNIT – IV

MySQL Replication and different Replication Architecture - MySQL Replication, MySQL Replication Architecture, MySQL Replication Basics, MySQL Replication Types, Master-Slave Replication Setup, Master-Slave Replication Filters, Master-Master Replication
MySQL user management and routines & triggers - user account management, user privileges, administrative privileges, database access privileges, creating and rename user account, drop user account, grant privileges, revoke privileges, routines and triggers.

UNIT - V

MySQL resource allocation - MySQL memory consumption, MySQL memory limitations, Securing MySQL - Operating System security, file system security, log files & security, network security, optimizing queries, identifying candidate, using explain, using show warnings

References:

- Abraham Silberschatz, Henry Korth, S. Sudarshan, “Database Systems Concepts”, 7th Edition, McGraw Hill
- R. Elmarsri and SB Navathe, “Fundamentals of Database Systems”, Pearson
- Bipin Desai, “An Introduction to database Systems”, Galgotia Publications.
- GauravVaish-Getting Started with NoSQL Paperback
- Dan McCreary, Ann Kelly-Making Sense of NoSQL: A guide for managers and the rest of us 1st Edition
- Paul DuBois-MySQL (4th Edition) 4th Edition
- VaswaniVikram-MySQL(TM): The Complete Reference - The Complete Reference Paperback

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	2	2	2	1	1		1	1	1	1
2	3	3	3	3	2			1	1	1	1	
3	3	3	3	2	2	1	1		1		1	1
4	3	3	2	2	1		1	1	1		1	

3BCA5 Open Elective-3
3BCA5(A) - Linux & Shell Programming

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	0	1/2	3/3	40	10	0	50

Course Objectives:

- Understanding the basic set of commands and utilities in Linux/UNIX systems.
- To learn command structure of LINUX, various types of shells and types of commands and familiarize students with some general commands, directory and file related commands,
- To learn editors available in LINUX and the detailed working on the most Vi editor

Course Outcomes:

- Understand Shell variables and shell keyword.
- Write the shell program for simple problem.
- Understand type of process and pipes in Linux.
- Understand back ground and fore ground Process
- Understand Linux System Administration

Unit-wise Syllabus

UNIT – I

Linux introduction and file system - basic features, different flavors of linux. advantages, installing requirement, basic architecture of Unix/Linux system, kernel, shell, linux standard directories. Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less.

UNIT–II

Creating and viewing files using cat, file comparisons – cmp&comm, view files, disk related commands, checking disk free spaces. Essential Linux commands understanding shells, processes in linux - process fundamentals, connecting processes with pipes, redirecting input output, manual help, background processing.

UNIT–III

Managing multiple processes, changing process priority with nice, scheduling of processes at command, cron commands, kill, ps, who, sleep, Printing commands, touch, file related commands -wc, cut, dd, etc. Mathematical commands- bc, expr.

UNIT - IV

Creating and editing files with vi& vim editor. Shell programming- Basic of shell programming, Various types of shell available in Linux, comparisons between various shells, shell programming in bash, read command, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automate system tasks.

UNIT - V

Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Filter using regular expressions – grep, awk, egrep, and sed.

References:

- Sumitabha Das "Unix - Concepts & Applications" (Third Ed.) Tata Mcgraw Hill Publications.
- Graham Glass & King Ables, "Unix for Programmers and Users" (Third Ed.) - Pearson Education India.(Low Prices Edition)
- Cristopher Negus "Red Hat Linux 9 Bible" IDG Books India Ltd.
- Jack T Ackett, David Gunter " Using Linux" PHI, EEE Edition
- Nicholas Wells "Linux Installation and Administration" Vikas Publishing, New Delhi
- Yashwant Kanetkar "Unix Shell Programming" BPB Publications,
- Red Hat Linux Unleashed Techmedia (Bpb Publications)
- Wells "Linux Networking and Security" Vikas Publishing, New Deihi

LIST OF PRACTICAL's:

1. Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd.
2. Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man, date.
3. Usage of following commands: chmod, grep, tput (clear, highlight), bc.
4. Write a shell script to check if the number entered at the command line is prime or not.
5. Write a shell script to modify "cal" command to display calendars of the specified months.
6. Write a shell script to modify "cal" command to display calendars of the specified range of months.
7. Write a shell script to accept a login name. If not a valid login name display message – "Entered login name is invalid".
8. Write a shell script to display date in the mm/dd/yy format.
9. Write a shell script to display on the screen sorted output of "who" command along with the total number of users .
10. Write a shell script to display the multiplication table any number,
11. Write a shell script to compare two files and if found equal asks the user to delete the duplicate file.
12. Write a shell script to find the sum of digits of a given number.
13. Write a shell script to merge the contents of three files, sort the contents and then display them page by page.
14. Write a shell script to find the LCD(least common divisor) of two numbers.
15. Write a shell script to perform the tasks of basic calculator.
16. Write a shell script to find the power of a given number.
17. Write a shell script to find the factorial of a given number.
18. Write a shell script to check whether the number is Armstrong or not.
19. Write a shell script to check whether the file have all the permissions or not.
20. Program to show the pyramid of special character "*"

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	1			1		1		1		1
2	3	3	2	1					1	1		1
3	3	2	3	3	2	1	1	1				1
4	3	2	3	2	2						1	1
5	3	2	1	2	2	1		1	1	1	1	1

3BCA5(B)–Visual Design with Corel Draw

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	0	1/2	3/3	40	10	0	50

Course Objectives:

- To Learn the Basics difference of Vector and Raster Graphics.
- To Basic Knowledge of CorelDraw Graphics Suite.
- Use Advanced Tools For Creating Drawings.
- To Learn Advanced Output Options For Printing, And Advanced Techniques For Text Manipulation.
- To Learn Various Color Models

Course Outcomes:

- Work With Artistic Text For The Creation of Logos.
- Work With Documents In The Corel Draw Application.
- Creating Templates.
- Work With Paragraph Text and Produce Multi Page Publications.
- Import and Edit Bitmaps. Vector art.

Unit-wise Syllabus

UNIT-I

Introduction- Vector vs. Raster Graphics, Getting Started with CorelDraw, File Management, Setting Up the Page, Moving Around and Viewing Drawings, Customizing the Toolbars.

UNIT-II

Tools-Selection, Shape and Crop Tools- Selection Tool, Pick Tool, Shape Tool, Smudge Tool, Free Transform Tool. Zooming, Curve & Smart Fill Tools-Zoom Tool, Pan Tool, Freehand Tool, Line Tool, Shape, Text & Table Tools- Rectangle Tool, 3-Point Rectangle Tool, Ellipse Tool, 3-Point Ellipse Tool, Polygon Tool, Star Tool, Complex Star Tool, Graph Paper Tool, Spiral Tool, Basics Shape, Arrow Shapes, Follow Chart Shapes, Banner Shapes, Callout Shapes, Text Tool. Effects, Eyedropper & Fill Tools

UNIT- III

Colors Basics-Color Theory, RGB Color Model, CMYK Color Model, Working With Color Styles and Harmonies, Font, Typography,Text Tool, Artistic Text, Formatting Text.

UNIT- IV

Document Settings & Changing Any Objects- Starting a Document, Zooming, Panning & Scrolling, Creating Objects. Working With Bitmaps, Selecting Sizing and Transforming Objects, Coloring and Styling Objects, Positioning Objects, Grouping and Combining Objects

UNIT- V

Importing, Exporting & Saving- Importing Images, Exporting images, setting up Documents for Printing - Print multiple Pages, Using Layers, Case Study: Sticker, Letterhead with Logo, Flex Banner, Flyer, Brochure, Change the page size and orientation

Reference Books:

- Steve Bain “CorelDraw 12: The Official Guide” Dreamtech Press, 2004 ISBN8177224492, 9788177224498
- Foster D. Coburn “CorelDRAW 12 ”, Inc., 2004, ISBN0974980102,9780974980102
- Rick Altman “Mastering CorelDraw 9” “Mastering Series , Edition4, illustrated, the University of California, Digitized 4 Dec 2010 ISBN 0782125204, 9780782125207

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	1	2	3	1	1		1		1		1
2	3	2	2	2					1	1		
3	2	1	1			1		1				1
4	3	1	1	1							1	
5	3	1	1	1	1	1		1	1	1	1	1

3BCA6-Computer Lab-3

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
-	-	+0/2	+0/2	0	20	80	100

Practical List on Web Designing

1. Write an HTML code to display your education details in a tabular format.
2. Write an HTML code to display your CV on a web page.
3. Write an HTML code to create a Home page having three links: About Us OurServices and Contact Us. Create separate web pages for the three links.
4. Write an HTML code to create a login form. On submitting the form the user should get navigated to a profile page.
5. Write an HTML code to create a Registration Form. On submitting the form theUser should be asked to login with this new credentials.
6. Write an HTML code to create your Institute website Department Website andTutorial website for specific subject.
7. Write an HTML code to illustrate the usage of the following:
Ordered List
Unordered List
Definition List
8. Write an HTML code to create a frameset having header navigation andcontent sections.
9. Write an HTML code to demonstrate the usage of inline CSS.
10. Write an HTML code to demonstrate the usage of internal CSS.
11. Write an HTML code to demonstrate the usage of external CSS.
12. Write a Java script to prompt for users name and display it on the screen.
13. Design HTML form for keeping student record and validateit using Java script.
14. Write an HTML program to design an entry form of student details and send itto store at database server like SQL Oracle or MS Access.
15. Write a JavaScript program to display the current day and time in the following format.
Sample Output : Today is : Tuesday.
Current time is : 10 PM : 30 : 38
16. Write a JavaScript program to print the contents of the current window.
17. Write a JavaScript program to find the area of a triangle where lengths of the three of its sides are 5, 6, 7.
18. Write a JavaScript program to calculate multiplication and division of two numbers (input from user).

Practical List on Linux Server administration

1. Write a Shell script that displays list of all the files in the current directory to whichthe user has read, write and execute permissions.?
2. Write a Shell script to list all of the directory files in a directory.
3. Write a Shell script to find factorial of a given integer?
4. Write a shell script to change data format. Show the time taken in execution of this script.
5. Write a shell script to print files names in a directory showing date of creation & serial number of the file.
6. Write a shell script to count lines, words and characters in its input (do not use wc).
7. Write a shell script to compute gcdlcm& of two numbers. Use the basic function to findgcd& LCM of N numbers.

8. Write a shell script to find whether a given number is prime.
9. Write shell script for Showing the count of users logged in.
10. Run all the command given in syllabus using all the syntax in command mode.

Practical List on Multimedia and Animation

1. Create a PowerPoint slide show that includes the following slides
 - A “homepage” slide with a title and links or buttons to each of your other five pages.
 - A slide that uses a sound effect that is integrally tied to the information on the page
2. Create a PowerPoint slide show that includes the following slides
 - A slide that links to a web page.
 - A slide that has a bulleted list of items that are animated so that the items appear on the page one-at-a-time. Set it up so that each item dims as the next item appears.
3. Using PowerPoint do following exercise.
 - To change your slide layout
 - To add shadows to text
 - To add a button that links to another page or website
4. Simple image editing using Photoshop-
 - Start Photoshop and open the image from your personal drive and try out the different tools in Photoshop
 - Try out the functions like Rotate, Resize, Crop, Zoom
5. Color change, image extraction and merging of images.
6. Make a banner in Photoshop using layers.
7. Creating a logo using Corel Draw.
8. Creating a Visiting card using Corel Draw.
9. Take video footage add some Transitions using Adobe premiere.
10. Take video footage addTitles and Text using Adobe premiere.

Practical List on RDBMS using MySQL

1. Create a table EMP in MYSQL

EmpName	Salary	Age	Country	Email
Anil	5000	45	India	xyz@yahoo.com
Raj kamal	6000	34	USA	dinesh_hyt@hotmail.com
Deepak	2000	33	Nepal	Sunil_ftrxyz@gamil.com
Anujkumar	18000	56	Bhutan	Raj_xyz@gmail.com

2. Write a MySQL statement to insert your record into the above table against each columns.
3. Write a MySQL statement to insert 3 rows in above table by a single insert statement.
4. Write a MySQL statement to change the email and country name for Deepak.
5. Write the MySQL statement to insert a new column “address”.
6. Write the MySQL statement to delete column “Age” in above table.
7. Write the MySQL statement to show those records who’s age >34 .
8. Write a query to get the minimum age from employees table.
9. Write a query to get the average salary and number of employees.
10. Write a query to get the maximum salary and name employee.

Semester - IV

4BCA1 - Programming with Java

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- Understand the usage of Java SDK environment and apply to create, debug and run simple java programs.
- Understand and apply the basic concept of java programming such as character set, variables, data types, conditional and iterative execution, methods, etc.
- Understand and implement the Object-Oriented Programming (OOPs) concepts in java, through defining classes, invoking methods, using class libraries, etc.
- Learn the creation and the usage of arrays and threads in java.
- Learn and demonstrate java applets.

Course Outcomes

1. Explain the object oriented concepts and apply them for solving real problems.
2. Demonstrate and apply the various features Java SDK to develop, run and debug java programs.
3. Apply java technology to develop the small applications, utilities, and web applications.
4. Apply events management and layout managers using awt, swing, jdbc and servlet for developing the software for various problems.

Unit-wise Syllabus

UNIT-I

C++ vs java, java and internet and WWW, java support systems, java environment, java program structure, tokens, statements, java virtual machine, constants & variables, data types, type casting, operators, expressions & its evaluation, decision making and branching, loops, jumps in loops, labeled loops.

UNIT-II

Defining a class, adding variables and methods, creating objects, accessing class members, constructors, method overloading, static members, nesting of methods, inheritance: extending a class, overriding methods, final variables and method~, final classes, finalizes methods, abstract methods and classes, visibility control.

UNIT-III

Arrays, one dimensional & two dimensional, strings, vectors, wrapper classes, defining interfaces, extending interfaces, implementing interfaces, accessing interface variables, system packages, using system packages, naming conventions, creating packages, accessing a package, using package, adding a class to a package, hiding classes.

UNIT-IV

Threads, 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 unable interface.

UNIT-V

Applets, local and remote applets, applets VS applications, writing applets, applets life cycle, 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 interface.

References:

- E. Balagurusamy, "Programming with Java, a Primer", TMH, ISBN-13: 978-0-07-061713-1, ISBN-10: 0-07-061713-9.
- Patrick Naughton and Herbert Schildt, "Java: the Complete Reference", TMH Publication, ISBN 0-07-463769-X.
- Yashavantkanetkar, "Let us Java", BPB Publications.
- Cay Horstmann, "Big Java", Wiley Publication
- Peter Norton, "Java Programming", Techmedia Publications.
- Joseph Weber, "Using Java 1.2", PHI, ISBN -81-203-1558-8.

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	2	2	2	1		1	2	1	2	1
2	3	2	3	2	3	1			1	1	2	1
3	3	1	3	2	3	2		2	2	1	2	1
4	3	2	2	2	1		1	2	2	2	1	2

4BCA2- Software Engineering

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
5/1	1/1	0	6/6	80	20	0	100

Course Objectives:

- Understand, learn and apply the theoretical and practical knowledge of software development such as software development paradigms, process, models, tools and techniques.
- Understand and learn the process of software requirements identification, analysis, review, and learn recording requirements in the standard format of the SRS document.
- Understand the various types and levels of software testing and basic approaches of test case designing.
- Gain the knowledge of the various models of software quality, estimation, quality assurance and control.

Course Outcomes:

1. Identify, analyze, review and validate the requirement of software components and system, and also prepare software requirement specification (SRS) document using relevant standards, tools and methodologies.
2. Manage a software project by applying project management concepts such as planning, scheduling and risk management for developing qualitative and economic software.
3. Develop and maintain the software system to solve real life problems in team with sustainability.
4. Work effectively in various profiles of software developing team such as software analyst, architecture, programmer, tester, quality assurance and project manager.

Unit-wise Syllabus

UNIT - I

Software : software characteristics and applications, software engineering - a layered technology, software process models - linear sequential model, prototype & RAD model, incremental model and spiral model. Project metrics: software measurement–size oriented, function oriented metrics, extended function point metrics.

UNIT - II

Software project planning: objectives, decomposition techniques, and empirical estimation models. Analysis concept and principles: requirement analysis, analysis principles.

UNIT – III

Design concepts and principles: design process, design concepts, design principles, effective modular design, human computer interface design, interface design guidelines.

UNIT – IV

S/w quality assurance: quality concepts, reliability s/w testing models: s/w testing fundamentals, white and black box testing, basic path testing, testing strategies: strategic approach to s/w testing, unit testing, integration testing, validation testing, system testing.

UNIT - V

S/w reuse: reuse process, classification and retrieving components, economics of s/w reuse

Software maintenance- need for software maintenance, maintenance models.

Software configuration management (SCM) – version control – SCM process – software configuration items

Computer aided software engineering (CASE): introduction to case, taxonomy of case tools

References:

- R S Pressman, Software Engineering
- Pankaj Jalote An Integrated Approach To Software Engineering
- K. K. Aggarwal, Yogesh Singh, Software Engineering,
- Ian Sommerville, Software Engineering, Addison-Wesley Publishing Company,
- James F. Peter, Software Engineering - an Engineering Approach, John Wiley,
- Fairley Richard Software Engineering Concepts, Tata McGraw Hill

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	2	2	2	1		1	2	1	2	1
2	3	2	3	2	3	1			1	1	2	1
3	3	1	3	2	3	2		2	2	1	2	1
4	3	2	2	2	1		1	2	2	2	1	2

4BCA3(A) - Windows Server Administration

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- Provide a strong formal foundation knowledge in Windows server installation and administration and inculcate skills in participants to administer the Windows server
- Understand Architecture of Windows Server 2012.
- Learn the installation of Server, Creating & implementing plans.
- Understand and learn the Implementation of User active directory and domain controller.
- Gain the knowledge of Implementation and configuration of file services & group policies.

Course Outcomes:

1. Explain and demonstrate Architecture of Windows server 2012.
2. Install and configure Windows Server, and Create& implement the plans successfully.
3. Implement and manage User Active Directory and domain controller.
4. Implement and configure the file services & group policies, Firewalls and IPsec in windows server.

Unit-wise Syllabus

UNIT-I

Preparing for Windows Server 2012 - Planning for Windows Server 2012, Assessing the readiness of your environment

Deploying servers - Installation options, Preparing the build lab, Building images, Deploying images

UNIT - II

Server remote management - Server Manager, Server management tasks, Installing roles and features, Windows PowerShell automation

Deploying domain controllers - Preparing for deploying domain controllers, Deploying domain controllers using Server Manager, Deploying domain controllers using Windows PowerShell

Active Directory administration - Administering Active Directory objects using ADAC, Enabling advanced features using ADAC, Administering Active Directory using Windows PowerShell

UNIT - III

Network administration - Ensuring DHCP availability, Implementing DNSSEC, Managing networking using Windows PowerShell, Configuring IPv6/IPv4 interoperability

Hyper-V virtualization - Deploying and configuring Hyper-V hosts, Deploying and configuring virtual machines, Managing virtual machines

UNIT - IV

File services and storage - Deploying Storage Spaces, Provisioning and managing shared storage, Configuring iSCSI storage

Print and document services - Deploying and managing print servers, Managing print servers using Windows PowerShell

UNIT - V

Implementing Group Policy - Planning, configuring, and managing Group Policy, Managing Group Policy using Windows PowerShell, Implementing Group Policy preferences
Configuring Windows Firewall and IPsec - Configuring Windows Firewall with Advanced Security, Configuring IPsec

References:

- Mitch Tulloch, Installing & Configuring Windows Server 2012 Training Guide, Microsoft Press.

Cos	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	3	1	2	1	2	1	1	2	1	1
2	3	2	2	2	1	1	2		2	1	1	2
3	3	2	1	2	1	1		1	1	1	1	1
4	3	3	2	1	2	1	1	1	1	2	2	1

4BCA3 (B) - Cyber Security

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- Understand the fundamental concepts of Cyber and Information Security
- Gain the knowledge of different types and working of malware and security hazards incident of real-world.
- Understand cryptography techniques and apply them for secure data communication and authentications
- Understand the working and implementation of Firewall.
- Understand the concept of cyberspace and cyber crime and digital signature

Course Outcomes:

1. Explain various security concepts and apply them in daily cyber use.
2. Configure firewall and other security setting in computer
3. Perform the malware and spam email identification, analysis, virus scanning and cleaning and other services using security tools
4. Explain and practice the Cyber Law, Ethics, and Intellectual Property Rights, Patent and Trademark and Design Law

Unit-wise Syllabus

UNIT-I

Information security: overview, information security importance, information security components. Threats to information system- external and internal thread, security threat and vulnerability- overview, malware, type of malware: virus, worms, trojans, rootkits, robots, adware's, spywares, ransom wares, zombies etc., desktop security-

UNIT-II

Application security- database security, e- mail security, internet security, principles of security- confidentiality, integrity, availability, introduction to cryptography- symmetric key cryptography, asymmetric key cryptography, message authentication, applications of cryptography. Security technology- firewall, type of firewall, firewall benefits, VPN, antivirus software

UNIT-III

Cyberspace- cloud computing & security, social network sites security, attack prevention- passwords, protection against attacks in social media, securing wireless networks, security threats.

UNIT-IV

Cybercrime- concept of cybercrime, type of cybercrime, phishing, cyber crime prevention, case study, security threats to e- commerce- electronic payment system, Digital Signature- digital signature process.

UNIT-V

ISO- international organization for standardization, world intellectual property organization, cyber law- cyber law in India, IT act 2000, intellectual property rights- definition, intellectual property, categories of intellectual property, rights protected under intellectual property, copyright, patent and trademark, design- design law in India

References:

- Allan Friedman and P. W. Singer, Cyber Security and Cyber war: What Everyone Needs to Know by Published Oxford University
- Don Franke, Cyber Security Basics: Protect Your Organization by Applying the Fundamentals by Publisher CreateSpace Independent Publishing Platform, 2016
- Mayank Bhushan, Fundamental of Cyber Security

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	1	2	2	2	1	3	1	2		2
2	3	2	2	3	3	1		2	1	2	1	2
3	3	3	2	3	2	2	1	2	2	2	1	2
4	3	3	1	2	1	3	2	2	3	2	1	2

4BCA4-E-Commerce and E-Governance

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	0	1/2	3/4	40	10	0	50

Course Objectives:

- Gain Knowledge to develop skills in understanding strategic issues related to e-commerce and e-governance
- Obtain the broad knowledge of state of art of e-governance and e-commerce activities and scenario in India
- Understand the electronic payment systems and security
- Gain knowledge of government initiative, policy and law and its implementation in the country in area of e-commerce and e-governance.

Course Outcome:

1. Explain and demonstrate E-Governance Initiatives at the National Level in India
2. Make Classification of E-Commerce and E-Governance
3. Think innovatively and analyze critically to startup New Successful Business Ideas.
4. Explore and exploit Government E-seva such Aadhar Card, Pass Port, Dig locker, E-payment, M-payment etc

Unit-wise Syllabus

UNIT-I

Introduction to E-commerce: Definition, History of E-commerce, E-business Models B2B, B2C, C2C, C2B, legal; Environment of E-commerce, Dimensions of E-commerce, ethical issues, electronic data interchange, value chain and supply chain, E-commerce Marketing, E-commerce Strategy, E-commerce Infrastructure, Advantages and Disadvantages of e-commerce.

UNIT - II

Electronic payment systems: payment gateways, payment cards, credit cards, debit cards, smart cards, e-credit accounts, e-money, marketing on the web, categories of e-commerce, EDI, marketing strategies, advertising on the web, customer service and support, internet banking, introduction to m-commerce, case study: e-commerce in passenger air transport, element of e-commerce, issues of e-commerce.

UNIT - III

E-government, theoretical background of e-governance, issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of e-governance, e-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

UNIT - IV

E-readiness, e-government readiness, E- Framework, step & issues, application of data warehousing and data mining in e-government, Case studies: NICNET-role of nationwide networking in e-governance, e-seva. Origins in India E-Governance Projects in India, Measures to be considered before going for E-Governance, Work plan and Infrastructure. Digital payment initiatives in India, Digital Payment platforms and applications. Use of Aadhar number in digital services.

UNIT - V

E-government systems security: challenges and approach to e-government security, security concern in e-commerce, security for server computers, communication channel security, security for client computers. E-security network and web site risk for e-business, information technology act 2000 and its highlights related to e-commerce, e-security, firewalls, electronic market / e- shop, introduction to security, types of securities, security tools, network security, securities in e-payments.

References:

- Gary P. Schneider, "E-Commerce", Cengage Learning India.
- C.S.R. Prabhu, "E-Governance: Concept and Case Study", PHI Learning Private Limited.
- P. Tjoseph, S.J., "E-Commerce an Indian Perspective", Prentice-Hall of India.
- V. Rajaramn, "Essentials of E-Commerce Technology", PHI Learning Private Limited.
- Amir Manzoor " E-Commerce: an Introduction", Lambert.

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	1	2	2	2	1	3	1	2		2
2	3	2	2	3	3	1		2	1	2	1	2
3	3	3	2	3	2	2	1	2	2	2	1	2
4	3	3	1	2	1	3	2	2	3	2	1	2

4BCA5 Open Elective –4
4BCA5 (A) – Programming with Python

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	1/1	0	3/3	40	10	0	50

Course Objectives:

- To Introduce Python Programming Language as Multipurpose Programming Language with Features and Applications.
- To Learn Installing Python and Introducing Cross Multiplatform Usage of Python.
- To Practice Basic Language Features of Python and Implement OOPS Concepts Using Python.
- Learn core python structures and flow control, Create and run python functions
- Explore the python library functions for various purpose

Course Outcomes:

1. Install and use Python on Various Platform.
2. Understand and Explain various features of Python language
3. Design and Develop Python applications for data analysis using object-oriented concept
4. Build package and modules in Python with reusability and exception Aspect
5. Write and execute Simple programs for sorting and searching in Python.

Unit-wise Syllabus

UNIT - I

Planning the computer program: concept of problem solving, problem definition, program design, debugging, types of errors in programming, documentation.

Techniques of problem solving: flowcharting, decision table, algorithms, structured programming concepts, programming methodologies viz. Top-down and bottom-up programming.

Overview of programming: structure of a python program, elements of python.

UNIT - II

Introduction to python: python interpreter, using python as calculator, python shell, indentation. Atoms, identifiers and keywords, literals, strings, operators (arithmetic operator, relational operator, logical or Boolean operator, assignment, operator, ternary operator, bit wise operator, increment or decrement operator)

Creating python programs: input and output statements, control statements(branching, looping, conditional statement, exit function, difference between break, continue and pass.), defining functions, default arguments, errors and exceptions.

Iteration and recursion: conditional execution, alternative execution, nested conditionals, the return statement.

UNIT - III

Recursion, stack diagrams for recursive functions, multiple assignment, the while statement, tables, two-dimensional tables

Strings and lists: string as a compound data type, length, traversal and the for loop, string slices, string comparison, a find function.

UNIT - IV

Looping and counting, list values, accessing elements, list length, list membership, lists and for loops, list operations, list deletion. Cloning lists, nested lists

Object oriented programming: introduction to classes, objects and methods, standard libraries.

UNIT - V

Data structures: arrays, list, set, stacks and queues.

Searching and sorting: linear and binary search, bubble, selection and insertion sorting.

References:

- T. Budd, Exploring Python, TMH, 1st Ed, 2011
- How to think like a computer scientist: learning with Python / Allen Downey, Jeffrey Elkner, Chris Meyers. 1st Edition – Freely available online.
- <http://docs.python.org/3/tutorial/index.html>
- <http://interactivepython.org/courselib/static/pythonds>

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	1		2	2							1
2	3	1		1	2					1	1	1
3	3	3	3	3	2			1		1	1	1
4	3	3	3	2	2			1				1
5	3	3	1	2	1							

LIST OF PRACTICAL'S:

- Using for loop, print a table of Celsius/Fahrenheit equivalences. Let c be the Celsius temperatures ranging from 0 to 100, for each value of c, print the corresponding Fahrenheit temperature.
- Using while loop, produce a table of sines, cosines and tangents. Make a variable x in range from 0 to 10 in steps of 0.2. For each value of x, print the value of sin(x), cos(x) and tan(x).
- Write a program that reads an integer value and prints “leap year” or “not a leap year”.
- Write a program that takes a positive integer n and then produces n lines of output shown as follows. For example enter a size: 5

```
*
**
***
****
*****
```

- Write a function that takes an integer ‘n’ as input and calculates the value of $1 + 1/1! + 1/2! + 1/3! + \dots + 1/n$
- Write a function that takes an integer input and calculates the factorial of that number.
- Write a function that takes a string input and checks if it’s a palindrome or not.
- Write a list function to convert a string into a list, as in list (‘abc’) gives [a, b, c].
- Write a program to generate Fibonacci series.
- Write a program to check whether the input number is even or odd.
- Write a program to compare three numbers and print the largest one.
- Write a program to print factors of a given number.
- Write a method to calculate GCD of two numbers.
- Write a program to create Stack Class and implement all its methods. (Use Lists)
- Write a program to create Queue Class and implement all its methods. (Use Lists)
- Write a program to implement linear and binary search on lists.
- Write a program to sort a list using insertion sort and bubble sort and selection sort.

4BCA5 (B) DTP with Page Maker

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	1/1	0	3/3	40	10	0	50

Course Objectives:

- Acquire knowledge and develop skills of Page Maker, Printing Techniques and DTP Tools.
- Learn Design layouts and Use existing design template to Create Readable and Attractive Newsletters.
- Learn various features, Shortcut Keyboard Commands and their usage PageMaker
- Apply a Report Template to a Multi-Page Document.

Course Outcomes:

1. Create Documents and Templates, Add text into Documents using various Methods.
2. Apply different Formatting Styles to Characters and Paragraphs.
3. Import Graphics, Create objects using various tools, and effects to objects.
4. Create a book and export it into PDF.
5. Multiple Layout Design.

Unit-wise Syllabus

UNIT - I

Introduction to Desk Top Publishing (DTP), Photocomposing Machines 86 DTP, Definition, Need and Area of Application. Use of DTP in Offset Printing & Web Designing, Use of Desk Top Publishing in Publications, Importance of D.T.P in Publication, Advantage of D.T.P in Publication, Page Layout & Designing in a single page production. Laser printers - Use, Types, Advantage of laser printer in publication Difference between a word processor and Publication Software, Use and importance of DTP in Publication & Newspaper Printing, Various DTP Softwares and its application area.

UNIT - II

Introduction to Offset Printing Technology, Printers, Formatting of a text: Typography, Fonts, Point Size, Spacing, Breaks, Measurements etc. DTP & Page Layout Designing. Types of Printing: Lithography, Flexography, Gravure, Screen Printing, Offset Printing. Print Media & Offset Printing. Terms used in Offset Printing: Bleed, CMYK, Transparent Printouts - Bromide & Film. Halftone, Impression, Saddle Stitch, Perfect Bind, Negative & Positives for Plate were making

UNIT - III

Introduction to Adobe Page Maker 7.0, Aldus & Adobe Page Maker, Previous and current versions of Page Maker, Page Maker as a DTP Software, Difference between a Page Maker & Word Processing Software. Attribute settings: Tools, Styles, Menus, Templates, Alignments, Grids, Guides etc. Keyboard shortcuts, Templates & its use

UNIT - IV

Page Layouts-Margins and Page Orientations with various page sizes, Text Editing and Manipulation, Magazine & News Paper Page Layouts. Filters, Import and Export options, Placing of Text and Images, Auto flow and Story Editor, Different Layout views, Control Palatte, Layers & its use. Tab setting, Columns & Gutters, Use of Styles, Palettes & Colors, Import & Export. Files, Document Setup & Preferences. Master Pages and its use.

UNIT - V

Adobe Page Maker-Page and document setup, working with rulers, setting the unit measurement, Bullets, Column Balancing, Breaks Arrange, Fill & Stroke Options. Text Wrapping, Widows & Orphan lines, Revert Command and its use, Using Drop Caps and various style formats, Editing of Graphics and Frames. Defining Styles OLE & Embedding, Plugins, Mathematic Equation, Table Editor and its use. Polygon Setting 86 Rounded Corners.

References:

- Shelly, Gary B., Cashman, T, Microsoft Publisher 2003 Complete Concepts and Techniques .ISBN: 9780619200312
- Wempen, Faithe, Emergent Le, Learning Microsoft Office Publisher 2010, Student Edition ISBN: 9780135108994
- Weixel, Suzanne, Fulton, Desktop Publishing Basics ISBN: 9780619055363
- Proot, Kevin G., Adobe Pagemaker 7.0 ISBN: 9780619109561

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1		1		1	2							1
2	3	1		1	2						1	1
3	2	2	3	3		2		1		1	1	1
4	3	1	3	3	2			2				1
5	3	1	1	2	1				1		1	

4BCA6-Computer Lab-4

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
-	-	+0/2	+0/2	0	20	80	100

Practical List on JAVA

1. Write a program to find the largest of n natural numbers.
2. Write a program to find whether a given number is prime or not.
3. Write a menu driven program for following:
Compute Factorial of a number
Check whether a given number is odd or even.
Check whether a given string is Palindrome or not.
4. Write a program to print the sum and product of digits of an Integer and reverse the Integer.
5. Write a program to create an array of 10 integers. Accept values from the user in that array. Input another number from the user and find out how many numbers are equal to the number passed, how many are greater and how many are less than the number passed.
6. Write a program that will prompt the user for a list of 5 prices. Compute the average of the prices and find out all the prices that are higher than the calculated average.
7. Write a program in java to input N numbers in an array and print out the Armstrong numbers from the set.
8. Write java program for the following matrix operations:
Addition of two matrices
Multiplication of two matrices
Input the elements of matrices from user.
9. Write a java program that computes the area of a circle, rectangle and a triangle using function overloading.
10. Write a Java for the implementation of Multiple inheritance using interfaces to calculate the area of a rectangle and triangle.
11. Write a java program to create a frame window in an Applet. Display your name, address and qualification in the frame window.
12. Write a java program to draw a line between two coordinates in a window.
13. Write a java program to display the following graphics in an applet window.
Rectangles
Circles
Ellipses
Arcs
Polygons
14. Write a program for the following string operations:
Compare two strings
Concatenate two strings
Compute length of a string
15. Create a class called Fraction that can be used to represent the ratio of two integers. Include appropriate constructors and methods. If the denominator becomes zero, throw and handle an exception.
16. Write a program to Display Fibonacci series.

Practical List on Windows Server Administration

1. What's New in Windows Server 2016?
2. What's new in Windows Server 2016 Hyper-V?
3. What's new in DNS in Windows Server 2016?
4. Working with Windows Server 2016 Desktop Experience
5. Setup Your Virtual Lab
6. Preparing Virtual Lab Setup
7. Installing VMware Workstation on the Host Machine
8. Installing and Configuring the DC1 Virtual Machine
9. Configuring the DC1 Virtual Machine
10. Promoting the DC1 Virtual Machine as a Domain Controller
11. Installing and Configuring the SERVER1 Virtual Machine
12. Installing and Configuring the CLIENT1 Virtual Machine
13. Installing and Configuring the ROUTER Virtual Machine
14. Creating and Configuring the SERVER2 Virtual Machine
15. Creating Snapshots of Virtual Machines
16. Installing and Configuring Windows Server Core Machine
17. Managing Servers Remotely
18. Using Windows PowerShell to Manage Servers
19. Installing and Configuring Domain Controllers
20. Installing and Configuring Read-Only Domain Controller (RODC)
21. Installing a Domain Controller by Using IFM
22. Managing Organizational Units and Groups in AD DS
23. Using Windows PowerShell to Create User Accounts and Groups
24. Installing and Configuring the DHCP Server Role
25. Configuring IPAM with DHCP
26. Installing and Configuring DNS
27. Installing and Configuring Windows Deployment Services (WDS)
28. Implementing LAN Routing
29. Configuring IPv6 Addressing
30. Installing and Configuring Remote Access VPN Server
31. Installing and Configuring Disk Storage
32. Configuring a Redundant Storage Space
33. Implementing File Sharing
34. Implementing Shadow Copies
35. Implementing Network Printing
36. Implementing Group Policy Objects
37. Implementing App Locker and Firewall Using Group Policy
38. Installing and Configuring Network Load Balancing

Practical List on E-Commerce and E-Governance

1. Study of any two E-commerce website.
2. Study of any two E-Governance website.
3. How MP-Online works demonstrate its functions?
4. Make a small E-commerce website.
5. Make a small E-Governance website

Practical List on Cyber Security

- Q1. How to scan a network for devices using Nmap
- Q2. How to find vulnerability in any website using Nikto
- Q3. How to find whether a system is infected with a malware or not
- Q4. How to extract email header in order to identify email source
- Q5. How to create a malware or keylogger
- Q6. How passwords are stored in any websites
- Q7. How to crack password hash
- Q8. How to break into Windows or Linux System
- Q9. How to break into Wireless Network
- Q10. How to perform Advance phishing attacks
- Q11. How to generate a forensic report
- Q12. How to verify a integrity of a document

SEMESTER- V

5BCA1 –DOT NET PROGRAMMING WITH VB.NET & ASP.NET

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- Understand .NETFramework, its architecture and user programs
- Develop simple GUI and event-driven programs using VB.NET
- Identify challenges involved in .NET framework programming
- Using Databases in Web application with ADO.NET
- Develop Web applications using ASP.NET.

Course Outcomes:

- Understanding of various features of .NET Framework
- Design and develop event-driven GUI applications using VB.NET
- Design and develop software in team.
- Develop dynamic Web applications using databases in .NET technology.

Unit-wise Syllabus

UNIT- I.

.NET Framework : Features & Architecture, Common Language Runtime, Common Type System, MSIL, Class Libraries. Event Drive Programming, Methods and Events. Programming into Visual Studio, IDE of VB.NET- Menu Bar, Toolbar, Project Explorer, Toolbox, Properties Window, Form Designer, Form Layout, Immediate Window, ASP & HTML Forms, Introduction to VB.NET and C# Applications, MsgBox Function, InputBox Function, Startup Form,

UNIT- II

Visual Basic .NET Language: Operators, Conditionals, Loops, Statements, Variables, Data Types , Arrays and Dynamic Arrays, Operators. Procedures, Scope, and Exception Handling, Creating Functions, Exception Handling, Using Resume Next and Resume Line, Using On Error GoTo, Windows Forms : Loading, Showing and Hiding Forms, Working with Multiple Forms, Creating Windows Applications, Adding Controls to Forms, Handling Events, Multiple Document Interface (MDI) Applications, Dialog Boxes, Controls at Run Time, Mouse Events, Keyboard Events, Beeping, Deploying Applications

UNIT- III

.NET Tools: Control Class, Text Boxes, Rich Text Boxes, Labels, Link Labels, Buttons, Checkboxes, Radio Buttons, Panels, and Group Boxes, List Boxes, Checked List Boxes, Combo Boxes, and Picture Boxes, Scroll Bars, Splitters, Track Bars, Pickers, Notify Icons, Tool Tips, and Timers, Menus, Built-in Dialog Boxes, and Printing, Image Lists, Tree and List Views, Toolbars, Status and Progress Bars, and Tab Controls

UNIT- IV

Web Forms with ASP.NET : Web Form Controls, HTML, Web Applications , Multiform Web Project, Client Events, Title Bar Text, Error Page, Search Engine Keywords, Embedding Visual Basic Code in Web Pages, Validation Controls, Calendars. Introduction to Windows Services & Web Services

UNIT- V

Data Access with ADO.NET : Server Explorer Data Adaptors and Datasets, ADO.NET Objects, Data Connection, Dragging Tables , Dataset, Data Grid, Data Adapter Controls, Dataset Schema, MS Jet Database, Relational Databases. Binding Controls to Databases -- Simple Binding, Complex Binding, Navigating in Datasets, Data Forms. Handling Databases in Code. Database Access in Web Applications.

References:

- Steven Holzner VB.Net Programming-Black Book-Dreamtech Publications
- EvangelosPetroustos Mastering VB.Net - BPB Publications
- Mathew Macdonald -The Complete Reference Asp.Net- TMH
- Professional ASP.Net- Wrox Publication
- Stephen Walther Active Server Pages 2.0 (Unleashed) - Techmedia
- Eric a. Smith Asp 3 Programming Bible: IDG Books

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	2	2	2	2	2	2	2	2	2	2
2	3	3	3	3	2	1	2	1	2	1	1	1
3	3	3	3	3	2	1	2	1	2	1	2	2
4	3	3	3	3	2	1	2	1	2	1	2	2
5	3	3	3	2	2	2	2	2	1	1	1	1
6	2	3	2	3	2	3	2	1	2	1	1	1

5BCA2 –WEB DEVELOPMENT WITH PHP

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- Learn PHP programming environment to create, debug and run simple PHP programs.
- Understand PHP programming fundamentals such as character set, variables, data types, conditional and iterative execution, functions etc.
- Using PHP to develop applications for Web.
- Learn to use Arrays, Web forms, files, and databases with PHP to develop Web pages.

Course Outcomes:

- Develop programs using HTML and PHP.
- Develop PHP Program using Character set, variables, data types, conditional and iterative statements, functions etc.
- Develop WebPages using built-in functions related to string manipulation, mathematical, date and time etc.
- Develop Web pages using Arrays, Web forms, files, and databases with PHP

Unit-wise Syllabus

UNIT-I

Introduction to PHP, History of PHP, Versions of PHP, Features of PHP, Advantages of PHP over Other Scripting Languages, software requirements, Installation and Configuration of PHP, Installing and Configuring Apache to use PHP on Windows, Basic HTML, Embedding PHP in HTML, PHP Basic syntax, data types, comments, variables and constants, scope of variables, PHP arrays: creating array and accessing array elements, PHP String, PHP operators, precedence of operators, expressions, creating a PHP Script, running a PHP script.

UNIT- II

PHP conditional statements, switch case, PHP looping statements, while, for and do while loop, break, continue, exit, PHP functions: built-in and user defined function, declaration and calling of a function, function argument with call by value, call by reference, string manipulation, mathematical, date and time functions.

UNIT- III

Introduction to a web form, processing a web form, capturing form data, passing information between pages, PHP \$_GET, PHP \$_POST, with multi value fields, validating a web form, input validation, exception and error handling, introduction to cookies and session handling.

UNIT- IV

Working with database: PHP supported databases, using PHP & MySQL: Installation and configuration of MySQL on windows, checking configuration, connecting to database, selecting a database, adding table and altering table in a database, inserting, deleting and modifying data in a table, retrieving data, performing queries, processing result sets.

UNIT- V

Code re-use, require(), include(), and the include_path, PHP file permissions, working with files: opening, closing, reading, writing a file, file system functions and file input and output, working with directory: creating, deleting, changing a directory, file uploads, introduction to object oriented programming with PHP.

References:

- Steven Holzner, The Complete Reference PHP, TMH
- Steve Suehring, Tim Converse and Joyce Park, Wiley-India Pvt Ltd
- Matt Doyle, Beginning PHP, Wiley-India Pvt Ltd
- Joel Murach and Ray Harris, Murach's PHP & MySQL, SPD Pvt Ltd
- Browsers Like IE, Mozilla, Firefox Etc
- Server Software Xampp/Wamp/Lamp
- Www.Apachefriends.Org
- Www.W3.Org
- Www.w3schools.Com
- Www.Php.Net
- Www.MySql.Com
- Www.Phpmyadmin.Net

Cos	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	1	1	1	2	1	1	1	2	1	2	1
2	3	2	2	2	3	2	1	2	3	2	3	2
3	2	2	2	2	3	2	2	1	3	2	3	2
4	3	2	3	2	2	2	1	1	2	2	2	2
5	3	2	3	2	2	2	1	1	2	2	2	2

5BCA3 (A) –MATHEMATICS

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
5/5	1/1	0	6/6	80	20	0	100

Course Objectives:

- To understand concepts and operations in Set Theory and Relations.
- To understand concepts and operations in Matrices and Determinant.
- To Understand fundamentals of Reasoning.
- To provide foundations of Probability theory& Logic.
- To provide foundations of Statistics related to data analysis.

Course Outcomes:

- Student will be able to perform Mathematical Operations like Set operations, Matrix operations
- Student will be able to perform Statistical operations like mean, mode, median on given datasets.
- Understand and practice Mathematical relations and functions&probability theory.
- Understand and practice Determinant, Matrices& Logic.

Unit-wise Syllabus

UNIT – I

Sets and elements: power set, universal set, union and intersection of sets, difference of sets, complement of a set, ordered pairs, Cartesian product of sets, number of elements in the Cartesian product of two finite sets. Equality of sets, transitivity of set inclusion, universal set, complement of a Set, Subsets Proper and Improper Subsets, Union of Sets, properties of Union. operation, intersection of sets, disjoint sets, properties of intersection operation, relative complement of a set, De Morgan's Laws, Distributive Laws of Union and Intersection. Definition of Relation: Pictorial Diagrams, Co-domain and Range of a relation.

UNIT - II

Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain & range of a function. Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs. Sum, difference, product and quotients of functions. Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions, composite functions, inverse of a function. Binary operations.

Fundamental principle of counting. Factorial n . ($n!$), permutations and combinations.

UNIT - III

Determinant: Determinant of 3rd order, Cramer's rule, consistency of equations

Matrices: types of matrices, algebra of matrices, linear homogeneous equations, linear non-homogeneous equations.

UNIT - IV

Mathematical reasoning: mathematically acceptable statements. connecting words/ phrases – consolidating the understanding of "if and only if (necessary and sufficient) condition", "implies", "and/or", "implied by", "and", "or", "there exists" and their use through variety of examples related to real life and mathematics.

Definition of statistics, raw data, classification of data, average, scatter, range, relationship between mean, median, mode, dispersion, mean deviation, standard deviation, variance.

UNIT - V

Meaning of probability, random experiment an outcome, sample space, sample point, types of sample space, types of events, and probability of an event, total and conditional probability, probability distribution of a random variable, repeated independent (Bernoulli) trials and binomial distribution.

References:

1. Basics of Mathematics By R. D Sharma.
2. Statistics and Solution By V. K. Kapoor.
3. www.e-booksdirectory.com/mathematics
4. www.origoeducation.com/go-maths

Cos	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	2	2	2	2	1	1	2	1	2	1
2	3	1	3	2	3	2	2	1	2	1	2	1
3	3	1	3	2	3	2	1	2	2	1	2	1
4	3	2	2	2	1	2	2	2	2	2	1	2

5BCA3 (B) –MANAGEMENT THEORY & PRACTICE

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
5/5	1/1	0	6/6	80	20	0	100

Course Objectives:

- To help the students gain understanding of the functions and responsibilities of managers.
- To provide them tools and techniques to be used in the performance of the managerial job.
- To enable them to analyze and understand the environment of the organization.
- To help the students to develop cognizance of the importance of management principles.

Course Outcomes: On completion of this course, the students will be able to

- Understand the concepts of Management related to Business organization
- Demonstrate the roles, skills and functions of management in Business organization.
- Acquire knowledge and skills to identify organizational problems
- Understand various aspects associated with management of human resources, planning and performance

Unit-wise Syllabus

UNIT-I

Management basics: what is management, the history of management, types of manager, manager qualities. Management responsibilities, management tasks and functions. The business environment defining the organization, organization structure, the quality organization, organizational changes, centralization and decentralization, managing changes. Management obligations, social and professional responsibilities, government regulations.

UNIT- II

Strategy formulation the elements of strategy, the strategy formulation process, alliances and acquisitions, strategy formulation tools and techniques, plan implementation. Decision making the nature of management decision, the decision-making process, decision making techniques.

UNIT- III

Information presentation and reporting - principle, type of reports, presentation on modes, function reporting system, information and its uses, characteristics of information, flow of information. Brief introduction to project planning and management and its tools/ techniques- Gantt chart, PERT/CPM. Human resources management: concepts & functions, job analysis and role description.

UNIT- IV

Management skills: leadership and motivation the nature of leadership, leadership theories, delegation, motivation and motivation theories, need of motivation, motivation techniques. Team building defining and effective team, selecting team members, building teams, training and development. Effective communication, the communication process, presentation skills tools and techniques.

UNIT- V

Time Management- importance of time, characteristics of management tasks, determining time elements, time management techniques. Entrepreneurship entrepreneur and its role, how to become an entrepreneur, essentials steps to become an entrepreneur, EDP training.

References:

- Joseph L. Massie, Essentials of Management, Prentice Hall of India
- Biswajeet Patanayak, Human Resource Management, Prentice Hall of India
- Gomes-Mejia, Balkin & Hardy, Managing Human Resource, Prentice Hall of India
- Lesslie W. Rue & Lyod Byrns, Management, Tata Mc Graw hill, 2009.
- Joseph M. Putti, Harold Koontz, Essentials of Management, An Asian Perspective, 1998, Tata Mc Graw hill
- Management: An Introduction, David Boddy, Pearson
- Management & Organizational Behavior, Laurie J. Mullins with Gill Christy, Pearson

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	3	3	1	3	3	1	2	2	2	2
2	3	2	2	1	1	2	1	1	1	1	2	2
3	2	1		1	1		1	1	3	2	1	2
4	3	3	3	2	1	3	2	1	1	1	2	2
5	2	2	2	2	2	2	2	1	1	1	2	1

5BCA4 – MOBILE APPLICATION DEVELOPMENT

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	0	1/2	3/4	40	10	0	50

Course Objectives:

- To introduce Android platform and its architecture.
- To learn activity creation and Android UI designing.
- To be familiarized with Intent, Broadcast receivers and Internet services.
- To work with SQLite Database and content providers.
- To integrate multimedia, camera and Location based services & REST full web Services in Android Application.
- To explore publishing process of Android Application

Course Outcomes:

- Describe Android platform, Architecture and features.
- Design User Interface and develop activity for Android App.
- Use Intent, Broadcast receivers and Internet services in Android App.
- Design and implement Database Application and Content providers.
- Use multimedia, camera and Location based services in Android App.
- Discuss various stages in Android App publishing.

Unit-wise Syllabus

UNIT - I

Various mobile platforms, introduction to android, history and versions of android, android API, android architecture, android runtime, dalvik virtual machine, features of android, introduction and installation of eclipse and ADT plugin and/or introduction and installation of android studio, requirements and installation of android SDK, SDK manager, emulator, avd, android virtual device manager, Google play account, installing android app from google play, APK file.

UNIT - II

Setting up Development Environment, Installing Packages using SDK Manager, Android Project Structure, Creating Hello Android App, Deploy it on USB-connected Android device, Setting up an Emulator, Android Tool Repository, Manifest File, DDMS, File Explorer, Installing and Running Android - Hello App, Activity Life Cycle and its methods, Logcat, Components of an Android App – Activity, Service, Broadcast Receiver, Content Provider

UNIT - III

Layout – Linear Layout, Relative Layout, Scroll View Layout, Table Layout, Frame Layout, UI Resources – Layout Resources, UI Elements, Views – Text view, Edit Text, Button, Check Box, Radio Button, Image Button, Spinner, Navigating between Activities – Intent, Exchanging Data between Activities, Action Bar, Event Handling, Listeners, Notifying the User – Toast.

UNIT - IV

Using Threads, Image View, Exception Handling, Multimedia - Playing Audio using an Intent, Playing Video using an Intent, Playing Audio using Media Player, Playing Video using Video View, Fragment, Fragment Life Cycle.

UNIT - V

SQLite database, creation of database and tables, CRUD operations – create, retrieve, update and delete operations, Cursor, list view,

Introduction – REST full web Services, JSON, Google Play Services, location services, publishing apps.

References:

- Michael Burton, Donn Felker, "Android Application Development for Dummies", Dummies, ISBN : 9788126538775
- Pradeep Kothari, " Android Application Development (with Kitkat Support)", Kogent Learning Solutions Inc., Black Book, DreamTech Press, ISBN : 9789351194095
- W. Frank Ableson, Robi Sen, Et. Al., " Android in Action", Manning, ISBN : 9789350042915
- Charlie Collins, Michael Galpin, Et. Al., " Android in Practice", Manning, ISBN : 9789350042397
- Anubhav Pradhan, Anil V Deshpande, "Composing Mobile App, Learn | Explore | Apply using Android", Wiley, ISBN : 9788126546602
- James C. Sheusi, " Android Application Development For Java Programmers", Cengage Learning, 2013.
- Wallace Jackson, "Android Apps for Absolute Beginners", Apress, ISBN : 9788132211372
- <http://www.developer.android.com>

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	3	3	3	2	2	1	1	1	2	2
2	3	3	3	3	3	2	2	1	2	2	1	2
3	3	2	3	2	2	2	2	1	2	2	1	1

5BCA5(A) SOUND EDITING WITH AUDACITY

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	1/1	0	3/3	40	10	0	50

Course Objectives:

- To impart skills of audio editing.
- To learn using Audacity software for sound recording & editing
- To develop skills for recording and editing of audio files.
- Learn to export edited audio files to various formats

Course Outcomes:

- Gain proficiency using the Audacity software.
- Use of various audio file formats.
- Understanding Noise Floor, Removing Breaths in audio files.
- Exporting audio files.

Unit-wise Syllabus**UNIT-I**

Introduction to Audio, Sound and its Attributes, Analog v/s Digital Sound, Basics of Digital Audio Definition, Advantages, Audio Input/ Output Devices, What is Editing, Spatial and Temporal Continuity, Analog and Digital Editing, Montage, Pace and Rhythm, Editing and Sound, Digital Post Production. Various Capturing and Editing Software and Tools.

UNIT-II

Installation of Audacity, Setting Up Audacity for Speed (Arranging Tools And View), Setting Up Keystrokes, Clearing Out Unused Plugins, Setup for Effects. Correct Recording Settings- Microphone Volume And Playback, Recording. Control Panel Review-Start Recording, Play Recording, Stop Recording. Audacity Tools Tool Bar Use, Cursor

UNIT-III

Audio File Formats, Advantages and Disadvantages, Features. Compressed and Uncompressed Audio, Lossy and Lossless Compression, AIFF And AIFF C Format, BWF Format, RIFF-WAVE Format. Multitrack Digital Audio Recorders-DASH, R-DAT, ADAT. Editing- Understanding Noise Floor, Zooming In/Out, Cutting And Pasting, Doing Pickups, Removing Breaths, Track Control Panel Functions,

UNIT-IV

Saving/Exporting Tracks- AUDACITY Files, Importing/Dragging Files into AUDACITY, Noise Removal (Settings and Use) , Removing Breaths (Silence), Using Hard Limiter Prior to Normalizing, Labeling Track Sections (Point & Region Label), Removing Plosives/Snaps, Crossfades In & Out, Creating and Use of Effects Chain, Exporting Multiple Individual Tracks, Complete Recording Edit.

UNIT-V

Splitting Tracks into Sections/Using Time Shift. Tool- . Adding Music Bed, Fade In/Out (Not Crossfade), Shrink/Stretch Time of Audio, Watermarking, Exporting Tracks with Specific Kbps., Mixing, Mixing Process, Final Mixing, Changing Tracks from Stereo to Mono.

Reference Books:-

- The book of audacity record, edit, mix, and master with the free audio editor by carlaschroderpublisher: starch press
- 'Audacity' by 'Melanie Crowder', Publisher: Penguin Young Readers Group, ISBN: 9780147512499
- 'Digital Audio Editing Fundamentals' By 'Wallace Jackson Lompoc', California, USA ISBN-13 (pbk): 978-1-4842-1647-7, ISBN-13 (electronic): 978-1-4842-1648-4, DOI 10.1007/978-1-4842-1648-4

E -Reference:

- <https://ctl.jhsph.edu/help/views/tutorials/audacity/GuideToUsingAudacity.pdf>
- <https://link.springer.com/content/pdf/bfm%3A978-1-4842-1648-4%2F1.pdf>
- <https://flossmanuals.net/pub/audacity-en-2018.02.pdf>

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	2	1	1	1	2	2	1	1	0	1	1	2
2	2	2	1	2	1	1	0	1	1	1	2	2
3	2	3	3	2	1	2	1	0	0	2	2	1
4	2	3	3	2	2	1	0	0	1	2	1	0

5BCA5(B) PHOTO EDITING WITH PHOTOSHOP

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	1/1	0	3/3	40	10	0	50

Course Objectives:

- To impart skills of photo editing.
- To develop skills for layers and color.
- To identify and specify file formats.

Course Outcomes:

- Gain proficiency using the selection tools and colors
- Use sharpening techniques
- Use and control the adjustments and filters to improve images
- Use automated actions and batch edits.

Unit-wise Syllabus

UNIT - I

Introduction: Vector vs Bitmap graphics, Theory on graphic designing, Toolbar, Menu Bar, Options Bar, Toolbox All New, Screen Modes, Standard Screen Mode, Full Screen Mode with Menu Bar, Creating a New Document, Saving Files, Reverting Files. **Document Window:** Selecting Workspace, File Handling and cursor Preferences, Understanding Image Resolution and Pixel Logic, Changing the Resolution and size of an Image, Editing Images: Rotating, Cropping, Hiding Instead of Cropping, Adjusting the Canvas Size.

UNIT - II

Working with Selections Tools- Marquee, Lasso, Magic Wand. Making a Selection Based on Color Range, Modifying a Selection, Adding and Subtracting from a Selection. Commands- Expand and Contract, Grow and Similar, Refine Edges, Inverse Selection. **Transforming a Selection:** Scaling, Rotating, Distorting, Skewing, Warping, Saving and Loading Selection. **Pen tool:** the Color Picker Dialog Box, Eyedropper Tool, the Color Palette, the Swatches Palette, the Drawing Tools Using Ellipse Tool, Custom Shape, Pen Tool, Painting Tools, And Gradient Tool.

UNIT - III

Tool: Paint Bucket Tool, Brush Tool, Pencil Tool, Color Replacement Tool, Retouching Tools, Spot Healing Brush Tool, Healing Brush Tool, Patch Tool, Eraser Tools, Background Eraser & Magic Eraser Tool, Blur Tool, Sharpen Tool, Smudge Tool, Dodge Tool. **Color mode:** Different Color Modes in Photoshop, Changing the Color Mode, Making Color Adjustments, Color Levels. Palettes- Curves palette, Brightness/Contrast, Hue/Saturation, Histogram. Variations Command, File Formats in Photoshop: Bitmap (BMP), PSD, EPS, TIFF, GIF, JPEG.

UNIT - IV

Layers in Photoshop: About the LAYERS Palette, Rearranging layers, Applying a layer style, About Smart Objects and filters. Creating and Editing Smart Objects, Filter Gallery, Applying the Mosaic Tiles Filter, Liquify Filter, Applying the Vanishing Point Filter, Artistic Filters, Blur Filters, Brush Stroke Filters, Distort and Noise Filters, Sketch Filters, Render Filters.

UNIT – V

Creating an Action, Performing Photo merge in Photoshop, Text Editing in Photoshop, Finding and Replacing Text, Creating 3D Artwork in Photoshop, Creating a 3D Shape, Editing 3DShape, Animation in Photoshop. Exporting Formats: PSD, Eps, Jpeg, Gif, Tiff, PDF, BMP, TGA, PNG and etc.

References:

- Adobe Photoshop CS4 for Photographers: A professional Image Editors Guide By Martin Evening(2006)
- Photoshop CS4 in Simple Steps by Kogent Learning Solutions Inc. Published by dremtechpress(2008)
- Photoshop CS4 The Missing Manual By Lesa Snider King; Publisher: O'Reilly Media, December 2008;
- Understanding Adobe Photoshop: Digital Imaging Concepts and techniques By Richard M.Harrington; ISBN 0-321-36898-3; Published 2007 American Chemical Society
- Photoshop In depth -Benjanim&David (2001)
- Adobe Photoshop CS6 Classroom in a Book © 2012 by Adobe Press. ISBN-13: 978-0-321-82733-3, ISBN-10: 0-321-82733-3.
- <http://ptgmedia.pearsoncmg.com/images/9780321827333/samplepages/0321827333.pdf>
- Adobe Photoshop CS5 Classroom in a Book by Adobe Press: ISBN-13: 978-0-321-70176

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	2	1	1	1	2	2	1	1	0	1	1	1
2	2	2	1	2	2	2	0	1	1	2	2	2
3	2	3	3	2	2	2	0	0	1	2	2	1
4	2	3	3	2	2	2	0	0	1	2	2	1

5BCA6-COMPUTER LAB-5

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
-	-	+0/2	+0/2	0	20	80	100

PRACTICAL LIST ON PHP

1. Write a PHP script, to check whether the page is called from 'https' or 'http'.
2. Write a PHP script to redirect a user to a different page.
3. Write a PHP script, which changes the color of the first character of a word.
4. Write a PHP script to count number of lines in a file.
5. Write a PHP program to print out the multiplication table up to 6*6.
6. Write a PHP program to remove duplicates from a sorted list.
7. Write a simple PHP program to check that emails are valid.
8. Write a simple PHP program to verify that the user did not leave any fields blank when submitting the form.
9. Check to make sure the credit card number is composed of exactly 16 numerical digits.
10. Check to make sure that a Visa card number starts with a "4" and a MasterCard number starts with a "5".
11. Write a program in PHP to handle Cookies and Sessions.
12. Write a program in PHP to Create, Access and Destroy Sessions in PHP
13. Write a Web page that asks for the last name of a faculty member. Upon clicking "submit", the Web page should call a HTML/PHP script that retrieves faculty data from the database. If the last name does not match any faculty members, the script should indicate "no faculty match". If the last name does match, then all faculty members with the given last name should be printed. (For testing, note that both Thomas Moore and Emily Moore are in the faculty database.)
14. Write a Web page that asks for the first and last names of a faculty member and a phone extension. Clicking "submit" calls a HTML/PHP script that works as follows:
 - a. If no names are entered, the script lists all faculty.
 - b. If some names or phone information are listed, but these data do not match any entries in the directory, the script should indicate "no faculty match".
 - c. If some names or phone information are listed and match some directory entries, then all matching entries should be printed. For example, during 1998-1999, both Amit Verma and Sonali Choubey an office. Thus, entering telephone 3017 (but no name information) should return entries for both of these faculty members.
15. Write a Web page that asks for faculty data, including first name, last name, title, email, office, and telephone extension. Upon clicking "submit", the HTML/PHP script should check that all fields are filled in. If not, the script should print an error message. Otherwise, the script should insert the data into a new entry within the faculty table.

PRACTICAL LIST ON DOT NET PROGRAMMING WITH VB.NET & ASP.NET

1. Write a program to perform arithmetic operation in console application using switch case.
2. Write a program to perform reverse number.
3. Write a console application that obtains four int values from the user and displays the product.
4. If you have two integers stored in variables var1 and var2, what Boolean test can you perform to see if one or the other (but not both) is greater than 10?
5. Write an application that includes the logic from Exercise 4, obtains two numbers from the user, and displays them, but rejects any input where both numbers are greater than 10 and asks for two new numbers.
6. Write a console application that places double quotation marks around each word in a string .
7. Write an application that uses two command-line arguments to place values into a string and an integer variable, respectively. Then display these values.
8. Write an application that receives the following information from a set of students:
 - Student Id:
 - Student Name:
 - Course Name:
 - Date of Birth:The application should also display the information of all the students once the data is Entered. Implement this using an Array of Structures.
9. Create an application that allows the user to enter a number in the textbox named „getnum“. Check whether the number in the textbox „getnum“ is palindrome or not. Print the message accordingly in the label control named lbl display when the user clicks on the button „check“.
10. Write a program to declare class „Distance“ have data members dist1,dist2 ,dist3. Initialize the two data members using constructor and store their addition in third data member using function and display addition.
11. Define a class „salary“ which will contain member variable Basic, TA, DA, HRA. Write a program using Constructor with default values for DA and HRA and calculate the salary of employee.
12. Write a program to check whether the given number is armstong number or not.
13. Write a console application for bank account in C# .Net.
14. Write a console application to display student information using class and object.
15. Write a console application to display employee information using properties.
16. Write a console application for a class person having data members name & age. Accept the value for this using constructor. And display the output for one object.
17. Write a console application containing a method that will swap the value of two integer type variable.
18. Write a console application calculate the area and circumference of circle &rectangle using inheritance .
19. Write a program for calculates the area and circumference of circle & rectangle using abstract class.
20. Design a sign Up form & validate user phone no with exactly 10 digit and email-id.
21. Design a sign up form & validate username (minimum 8 characters &maximum 15 and only character) password and retype password (both should be same)
22. Design a web application form having loan amount, interest rate and duration fields. calculate the simple interest and perform necessary validation ie Ensures data has been entered for each field. Checking for non numeric value.
23. Create an application which will ask the user to input his name and a message, display the two items concatenated in a label, and change the format of the label using radio buttons and check boxes for selection , the user can make the label text bold ,underlined or italic and change its color . include buttons to display the message in

- the label, clear the text boxes and label and exit.
24. List of employees is available in listbox. Write an application to add selected or all records from listbox (assume multi-line property of textbox is true).
 25. "How is the book ASP.NET with c# by Raj Sharma?" Give the user three choice :i)Good ii)Satisfactory iii)Bad. Provide a VOTE button. After user votes, present the result in percentage using labels next to the choices.
 26. Create a project that calculates the total of fat, carbohydrate and protein. Allow the user to enter into text boxes. The grams of fat, grams of carbohydrate and grams of protein. Each gram of fat is 9 calories and protein or carbohydrate is 4 calories. Display the total calories of the current food item in a label. Use to other labels to display and accumulated some of calories and the count of items entered. The form food have 3 text boxes for the user to enter the grams for each category include label next to each text box indicating what the user is enter.
 27. Create a Global.asax file with Application variables cont, color1 and gotohp. Create a Session variable called cont1. Initialize cont as 0 and assign any color to color1. For the variable gotohp, give a hyperlink to any Website. Use the variables in a Web Form. Try these with the lock and unlock methods.
 28. Write a program that gets user input such as the user name, mode of payment, appropriate credit card. After the user enters the appropriate values the Validation button validates the values entered.
 29. Programs using ASP.NET Server controls. Create the application that accepts name, password ,age , email id, and user id. All the information entry is compulsory. Password should be reconfirmed. Age should be within 21 to 30. Email id should be valid. User id should have at least a capital letter and digit as well as length should be between 7 and 20 characters.
 30. Database programs with ASP.NET and ADO.NET. Create a Web App to display all the Empname and Deptid of the employee from the database using SQL source control and bind it to GridView . Database fields are(DeptId, DeptName, EmpName, Salary)
 31. Database programs with ASP.NET and ADO.NET Create a Login Module which adds Username and Password in the database. Username in the database should be a primary key.
 32. Write a program to get a user input such as the boiling point of water and test it to the appropriate value using Compare Validator.
 33. Database programs with ASP.NET and ADO.NET Create a web application to insert 3 records inside the SQL database table having following fields(DeptId, DeptName, EmpName, Salary). Update the salary for any one employee and increment it to 15% of the present salary. Perform delete operation on 1 row of the database table.
 34. Create a web page to display the cricket score from the table event (id, name, score). Refresh the website automatically after every 30 seconds.
 35. Write a program to display three images in a line. When any one of the images is clicked, it must be displayed below. On clicking the displayed image it must be cleared.
 36. Design a college website(minimum 4 pages)
 37. Design a company website(minimum 4 pages)

PRACTICAL LIST ON MOBILE APPLICATION DEVELOPMENT

1. Installing Android Environment
2. Create “Hello World” application. That will display “Hello World” in the middle of the screen in the emulator. Also display “Hello World” in the middle of the screen in the Android Phone.
3. Create an application with login module. (Check username and password).
4. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.
5. Create a menu with 5 options and selected option should appear in text box.
6. Create a list of all courses in your college and on selecting a particular course teacher-in-charge of that course should appear at the bottom of the screen.
7. Create an application with three option buttons, on selecting a button color of the screen will change.
8. Create and Login application as above. On successful login, pop up the message.
9. Create an application to Create, Insert, update, Delete and retrieve operation on the database.
10. Create a Simple Application using Android Resources.
11. Create a Simple Application using Layouts.
12. Create a Simple Application using Intents.
13. Create a Simple Application using user interfaces.
14. Create a Simple Application for playing Audio and Video files.

SEMESTER VI
6BCA1 –CLOUD COMPUTING

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- Basics of cloud computing.
- Key concepts of virtualization.
- Different Cloud Computing services
- Cloud Implementation and its tools
- Key components of Amazon Web Services
- Cloud Backup and solutions

Course Outcomes:

- Define Cloud Computing and memorize the different Cloud service and deployment models
- Describe importance of virtualization along with their technologies.
- Use and Examine different cloud computing services
- Analyze the components of Google Cloud platform
- Describe the key components of Amazon web Service
- Design & develop backup strategies for cloud data based on features.

Unit-wise Syllabus

Unit - I

Introduction to Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Bio-computing, Mobile Computing, Quantum Computing, Optical Computing, Nano-computing, Network Computing. Cloud Computing Fundamentals: Motivation, Need, Definition of Cloud Computing. Principles of Cloud computing: Five Essential Characteristics, Four Cloud Deployment Models, Three Service Offering Models, Cloud Ecosystem, Requirements for Cloud Services. Cloud Computing Architecture: cloud Architecture, User/Client Layer, Network Layer, Cloud Management Layer, Hardware Resource Layer, , Network Connectivity in Cloud Computing, Public Cloud Access Networking, Private Cloud Access Networking.

UNIT – II

Cloud Computing Management: Cloud Application, Benefits and Drawbacks Applications on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure, Managing the Cloud Application, Migrating Application to Cloud, Cloud Deployment Models: Private Cloud, Outsourced Private Cloud, Community Cloud, On-Premise Community Cloud, Hybrid Cloud. Cloud Service Models: Infrastructure as a Service, : Platform as a Service, Software as a Service, Introduction to Open Source Tools for IaaS, Paas& SaaS : Apache.

UNIT - III

Technological Drivers for Cloud Computing: SOA and Cloud, SOA and SOC, Benefits of SOA, Multi-core Technology: Multi-core Processors and VM Scalability, Memory and Storage Technologies, Cloud Storage Requirements, Networking Technologies, Web 2.0 : Characteristics, Difference from Web 1.0, Applications, Social Media, Marketing, Education. Web 3.0: Components , Semantic Web, Web Services, Characteristics, Convergence of Cloud and Web 4.0, Connecting Information: Facebook. Agile Software

Models: Agile SDLC for Cloud Computing, Features of Cloud SDLC, Agile Software Development Process, Advantages of Agile. Cloud Application Development Platforms: Windows Azure, Google App Engine, Forcecom. IBM Cloud Computing API

UNIT - IV

Virtualization : Full Virtualization, Para virtualization, Hardware-Assisted Virtualization, Hypervisor, OS Virtualization, Server Virtualization, Memory Virtualization, Storage Virtualization, Network Virtualization, Application Virtualization, Processor Virtualization, Memory Virtualization, Storage Virtualization, Network Virtualization, Data Virtualization, Application Virtualization, Hypervisors, Types of Hypervisors, Security Issues and Recommendations, From Virtualization to Cloud Computing VMware. Microsoft Hyper-V.

UNIT - V

Cloud Service Providers ; EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon Simple Queue Service, Microsoft Azure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM SmartCloud. Security in Cloud Computing, Cloud General Challenges,

Text Books:

- Essentials of Cloud Computing, K Chandrasekaran, CRC Press [ISBN: 3: 978--4822-0544-2]
- Raj Kumar Buyya, James Broberg and rezeiM.Goscinski, -Cloud Computing: Principles and Paradigms,-Wiley 2011.
- Srinivasan, J.Suresh,-Cloud Computing – a Practical Approach for Learning and Implementation, Pearson India, [ISBN 978131776513]
- Toby Velte, Anthony Velte, Robert Elsenpeter,-Cloud Computing, a Practical Approach - McGraw Hill, 2010 [ISBN: 0071626948]

References:

- Greg Schulz -Cloud and Virtual Data Storage Networking, Auerbach Publications [ISBN: 978-1439851739].
- Marty Poniatowski-Foundations of Green It- [ISBN: 978-0137043750].
- Learning Spring Application Development, Ravi Kant Soni, Packt Publishing.
- Michael Miller, Cloud Computing, 2008.
- Judith Hurwitz, Robin Bllor, Marcia Kaufman, Fern Halper, Cloud Computing for Dummies, 2009.
- BorkoFurht, Armando Escalante (Editors), Handbook of Cloud Computing, Springer, 2010.

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	1	1			1			1		1
2	3	2	2							1		1
3	3	2	2				1			1		1
4	3	2	2	2	2							1
5	3	3	3	2	2		2				2	1
6	3	2	2	2							1	1

6BCA2 - COMPUTERIZED ACCOUNTING WITH TALLY

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives: Students will try to learn:

- Basics of Tally Accounting software.
- Learn to create company, enter accounting voucher entries and create various type of books for the accounting purpose.
- Learn to do reconcile bank statement, do accrual adjustments,
- Learn to prepare and print financial statements, etc. in Tally Accounting software.

Course Outcomes: Students will able to:

- Explain basics of Tally Accounting processes.
- Define key terms related to Tally Accounting software.
- Create Company and enter accounting voucher entries and create various type of books in the software.
- Do the reconcile bank statement and perform other accrual adjustments
- Prepare and print financial statements, etc. in Tally Accounting software

Unit-wise Syllabus

UNIT - I

Tally configuration & INI setup, data directory & folders configuration, single & multiple user, Tally screen components, mouse / keyboard conventions & key, combinations, switching between screen areas, quitting Tally. Maintaining company data, basic company details, create/alter/select/load/close a company, chart of accounts, company features, configuration.

UNIT – II

Create, Alter & Display Groups and Ledgers, All accounting voucher types and transactions, Create and Alter new Voucher type, Item and Account Invoice transactions, Excise Invoice, Export Invoice, Transactions using Bill-wise details Create, Alter & Display Cost Centre and Cost Categories, Cost centre & Cost Category allocation in voucher entry, Creating Cost centre Class, Invoice entry in a Class situation, Create, Alter & Delete Foreign Currencies, Voucher entry using foreign currency, Bank Reconciliation, Interest calculations using simple & advance parameters, Interest calculations on outstanding balances & on invoices, Use of voucher class, adjustment of interest, Creation of voucher class, Invoice entry in a class situation.

UNIT – III

Create, Alter & Delete Budgets for groups, ledgers & cost centres, Defining credit limit & credit period, Display Budgets & variances, Create, Alter & Delete a scenario. Enabling Job Costing in Tally, Master creation & configuration for Job costing, Creation of Voucher type & Voucher class for Stock Transactions, Creation of Transfer journal for transfer of stock between godowns, Consumption journal Transactions, payment voucher, Godown summary Report, Job Work Analysis, Material consumption summary. Reports like balance sheet, Profit & Loss account, Ratio analysis, Trial Balance. Accounts books like cash/bank book, All ledgers, Group summary & vouchers, Sales, purchase & journal registers, Cost centre & category summary, Cost centre breakup, ledger & group breakup, outstanding receivables & payables, interest receivable & payable, Statistics, Cash & Fund flow, Day book, List of

Accounts, Reversing Journals, optional vouchers, post-dated vouchers.

UNIT – IV

Create, Alter & Display Stock Groups and Stock Items, Stock item behavior using costing and market valuation method, other behavior like treating all sales as new manufacture, treating all purchases as consumed, treating all rejections inward as scrap, ignoring negative balances, Treating difference due to physical counting, Create, Alter & Display Stock categories, Create, Alter, Display simple & compound units of measures, Stock items using alternate units, Defining standard cost & selling price, Defining Rate of duty, Defining MRP, Create, Alter & Display Godowns, Allocation of items to the Godowns, All inventory voucher types and transactions, Inventory details in accounting vouchers, Defining re-order level, Transactions using tracking numbers, Use of batch-wise details in voucher, Additional cost details in vouchers, Creating Bill of material, Cost estimation, Creating Price list & defining Price levels, invoice using Price list, Zero valued entries, Transactions in case of Different actual & billed quantities. Reports like Stock summary, Inventory books like Stock item, Group summary, Stock transfers, Physical stock register, Movement analysis, Stock group & item analysis, stock category analysis, Ageing analysis, Sales order & Purchase order book, Statement of inventory related to Godowns, categories, stock query, Reorder status, Purchase & Sales order summary, Purchase & Sales bill pending, Exception reports like negative stock & ledger, overdue receivables & payables, memorandum vouchers, optional vouchers, post-dated vouchers, reversing journals.

UNIT – V

Cheque Printing, Common printing options, Different printing formats, Multi-Account printing, Dynamic- Report specific options. Creating Group Company, Use of Tally vault, Using Security control & defining different security levels, Use of Tally Audit. Back-up & Restore, Splitting company data, Export & import of Data, ODBC compliance, use of E-mail, Internet publishing, Upload, web browser & online help, Re-write data.

References:

- Implementing Tally 6.3 by Nadhani; BPB Publications, ISBN:817656494X
- BPB Tally 6.3 by BPB Editorial Board (Hindi) BPB Publications, ISBN 81-7656-594-6

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	3	3	1	3	3	1	2	2	2	2
2	3	2	2	1	1	2	1	1	1	1	2	2
3	2	1		1	1		1	1	3	2	1	2

6BCA3- PROJECT WORK

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
0	2/2	4/8	6/10	80	20	0	100

All the candidates of BCA are required to execute a Project and submit its Project-Report. These projects are to be carried out on real life problems. The detailed guidelines related to project work is given in the last section in the curricula. Please read carefully and make your project accordingly.

6BCA4 SOCIAL MEDIA MARKETING

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	0	1/2	¾	40	10	0	50

Course Objectives:

- To understand about the Social Media and its importance for marketing success.
- To understand the process of integration of different digital media and create marketing content.
- To understand planning & control activities to effectively deliver goods and services.
- To learn principles of marketing, economics, accounting, operations management, and finance.
- To develop and implement social media strategies for B2B and B2C marketing for penetration, growth, and development.

Course Outcomes:

- Identify importance of the social media marketing for marketing success
- Demonstrate to create a blog and a social media marketing plan for a new product or service.
- Explain about Social Media, its various channels of operations, and its role in marketing strategy
- Use principles of consumer and social psychology to develop social media content and campaigns that engage consumers
- Draw on knowledge about word-of-mouth marketing to develop effective approaches for propagating ideas, messages, products, and behaviors across social networks
- Measure the impact of a social media campaign in terms of a specific marketing objective.

Unit-wise Syllabus

UNIT-I

Digital marketing overview- what is Digital Marketing , traditional marketing vs. Digital Marketing, understanding traffic, categorization of digital marketing for the business, Legal and Ethical issues, search engine optimization (SEO)- on page optimization, off page optimization. Goals: learn how to use dozens of proven digital marketing strategies.

UNIT-II

Social Media overview- Social Media features, social media tools and platforms, Social Media monitoring, Hashtag, viral content. **Social media marketing - SMM vs. SMO** benefits of using SMM social media strategy, Email marketing,

UNIT-III

Social media marketing - Facebook marketing-profiles and pages, business categories, Facebook page custom URL, invite page likes, scheduling posts, Facebook events, Facebook insights reports, competitor's Facebook page, connect with twitter. Facebook ad campaigns- ad objective, performance matrix, ad components, Facebook ad structure, Facebook insights, Facebook page promotion, video promotion. Goals: develop a Facebook campaign for the product concept.

UNIT-IV

Google Ads- Introduction to Ad words, keyword planner, Pay-Per-Click(PPC), PPC terminology, PPC AD on Google Facebook. Goals: Use social media to keep abreast of the latest trends in your industry.

UNIT-V

Content Marketing and security, Security for SMM, Social Media Privacy, Secure Payments and Website Encryption, Cookies, VPN, Digital Certificate, E-Governance, E-wallet,. Goals: Understand security issues related to social media and digital marketing

Reference Books

- Ryan Deiss, Russ Henneberry (2017) Digital Marketing for Dummies, John Wiley & Sons.
- Ahuja Vandana (2015) Digital Marketing, Oxford University Press.
- Ira Kaufman, Chris Horton (2014) Digital Marketing: Integrating Strategy and Tactics with Values, A Guidebook for Executives, Managers, and Students, Routledge,
- Matt Chiera (2018) Digital Marketers Sound Off: Tips, Tactics, Tools, and Predictions from 101 Digital Marketing Specialists, Matt Chiera,
- Puneet Bhatia (2017) Fundamentals of Digital Marketing, Pearson India, ISBN 9352861418, 9789352861415
- Dan Zarrella (2011) The Social Media Marketing Book, O'Reilly Media.
- Krista Neher (2013) Visual Social Media Marketing: Harnessing Images, Instagram, Infographics and Pinterest to Grow Your Business Online, Boot Camp Digital.

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	2	3	3	2	2	1	1	1	2	2
2	2	3	1	3	3	2	1	1	2	2	1	2
3	1	2	2	3	1	2	2	1	1	1	2	2
4	2	1	3	1	3	2	2	1	2	1	1	2
5	1	2	2	3	3	1	2	1	1	1	2	2
6	2	3	1	1	3	2	2	1	2	2	1	2

6BCA5 OPEN ELECTIVE –6

6BCA5(A)-VBA PROGRAMMING

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	1/1	0	3/3	40	10	0	50

Course Objectives:

- To Know the powers of Visual Basic for Applications (VBA, Macros)
- Understand the use of automate common and repetitive keystrokes
- Build powerful automated business tools quickly using VBA
- Speed up your production and reduce the time you have to spend staring at an electronic spreadsheet each day.

Course Outcomes:

- Create simple macros using the macro recorder and run them from shortcuts or buttons on the ribbon
- Use the VBA Editor to navigate projects and explore object properties. Create, copy and import/export modules
- Use the VBA Editor to navigate projects and explore object properties. Create, copy and import/export modules
- Explore a variety of ways our code can manipulate data within cells, create and navigate around worksheets and workbooks
- Using decision making and looping structures to control the way your program works

Unit-wise Syllabus

UNIT - I

Introduction to VBA - introduction to excel, introduction to programming, VBA overview and the IDE, quick review of macros, working with macros, how to use visual basic editor (programming environment), advantages of VBA. Understanding the VBA editor, module & procedures - the visual basic editor, parts of the VBA editor, modules and macros, about VBA forms, sub procedures & modules, creating forms, using controls and their properties, running VBA forms in excel. VBA syntax & grammar - objects – the grammar, using properties and methods, understanding parameters, the object browser, understanding object hierarchy, tools for better coding, moving to other cells, editing specific cells.

UNIT - II

Variables, arrays & constant - using the immediate window, gaining greater control through the immediate window, formatting cells, using variables, constants, object variables, dimensioning and usage of variables, displaying data and obtaining data from the user. Storing data in variables - how and when to declare variables, selecting data types, fixed and dynamic arrays, constants. Control Structure & program Flow - IF (ElseIf, Else), Select Case(), For Next Loop, For Each Loop(), Do Until Loop and Do While Loop, With, End With, Nesting Code.

UNIT - III

Building Procedures - Creating Sub and Function procedures, Calling procedures, Passing arguments to procedures, Building intuitive user interface - Communicating with the user through the message box, Gathering user information with the input box, Utilizing the File Dialog object and Dialogs collections, Creating Customized Dialog Boxes with User Form Objects - Command buttons, List and Combo boxes, Labels, Option buttons, Check boxes, Text boxes, Frames, Adding more functionality with advanced ActiveX control. Fonts & Backgrounds - Using Font Property in cells, Using Various Background Properties in Excel VBA, Creating a Counter, String Handling, Using Left, Right, Mid and Len Functions in VBA, Range Selection and Manipulation.

UNIT - IV

Objects & Collections - Workbook and Worksheet Object, Range Object and Cell Properties, Methods and Properties, Assigning Objects, Using Name Arguments. **Array** - What is Array & why use array, Declaring an Array, Sorting Data in Array, 2-Dimension Array, Dynamic Array, UBound, Storing Data in a range of an Array Elements, Using various array functions.

UNIT - V

Functions - using excel worksheet functions in VBA, VBA functions, user-defined functions, adding help to user defined functions, declaring variables in user defined functions, using ranges in user defined functions, creating and managing an add-in for user defined functions, **internet & excel** - copy hyperlinks and text from a webpage to spreadsheet, **interaction with other office packages** - communicating with word and powerpoint using excel VBA. **Modifying menus & toolbars** - simplifying user interaction with the command bar object, adding and removing command bar control objects.

References:

- Duane Birnbaum, Microsoft Excel VBA Programming for the Absolute Beginner Second Edition, Thomson, Course Technology
- John Green, Stephen Bullen, Rob Bovey, Michael Alexander, Excel 2007 VBA Programmer's Reference, Wrox Publishers
- Dr. Liew VoonKiong, Excel VBA Made Easy ebook

COs	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	1	2	1	2	2	1	2	1	1	1
2	3	3	2	1	1	1	2	2	2	2	2	1
3	3	3	3	3	2	1	1	2	2	1	1	1
4	3	3	3	2	2	2	1	1	2	2	2	1

6BCA5(B)- VIDEO EDITING WITH OPENSHOT

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	1/1	0	3/3	40	10	0	50

Course Objectives:

- To learn principles of editing
- To acquire skill of video editing techniques using Openshot
- To gain theoretical knowledge of video editing
- To produce good quality edited video content for the Web.

Course Outcomes:

- Understand techniques of editing.
- Use Openshot video editing software applications.
- Demonstrate theoretical and practical knowledge of video editing.
- Edit videos of different genres.
- Prepare a movie, collect digital video, and upload digital video on web.

Unit-wise Syllabus

UNIT-I

Introduction-OpenShot Video Editor, Features, System Requirements, License, Download and install openshot, Keyboard Shortcuts.

UNIT-II

Workspace and profiles - Main Toolbar - buttons to open, save, and export your video project. Timeline, Tracks & Layers, Profiles- Project Profile, Export Profile, Custom Profile.

UNIT- III

Working with Files- Files- Import Files, File Menu, Add File to Timeline, File Properties, Split Clip.

UNIT- IV

Clips- Cutting & Slicing, Preset Menu, Transform, Digital video effects, Adding text and titles Effects

UNIT- V

Transitions and Animation- Audio effects, audio mixing and editing, Animation, Key Frames, Bézier Presets for Animation, Import & Export.

References:

- Jesse Russell, Ronald Cohn “Openshot Video Editor” Publisher- “Book on Demand”, 2012 ISBN 5512282816, 9785512282816

E-Resource

- <http://www.openshot.org/static/files/user-guide/introduction.html>

Cos	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	1	2	3			2		1	3	2	1
2	2	2	1	2			1		1	2	3	2
3	2	1	1	2			2		2	2	2	1
4	3	1	1	1		1	3	1	1	3	1	1
5	3	2	3	1	1	1	2		1	3	2	1

6BCA6 COMPUTER LAB-6

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
-	-	+0/2	+0/2	0	20	80	100

PRACTICAL LIST ON TALLY

Practical Assignment -1

1. Create a Company as “Sagar Industries Ltd.” in Tally with inventory management.
2. Pass the following Entries :-
 - (i) Sagar started “Sagar Industries Ltd.” by bringing Capital Rs.3, 00,000/- Cash.
 - (ii) He deposited Rs.1, 00,000/- cash at ICICI bank.
 - (iii) He paid electricity bill for Rs.1, 200/- by cash.
 - (iv) He withdrawn Rs.10, 000/- cash for his personal use.
 - (v) He purchased the following item from Computer Lab. Ltd. on credit with 4% Vat rate.
 - (a) Computer - 10 Nos. - @20000/- each
 - (vi) He sold the following item to Somnath Traders in cash with 4% Vat rate.
 - (a) Computer - 5 Nos. - @27500/- each
 - (vii) He received Rs.6, 000/- as commission from Rohit by cash.
 - (viii) He paid House Rent for Rs.5, 000/- by cash.
 - (ix) He withdrawn Rs.25, 000/- cash from ICICI Bank.
 - (x) He purchased furniture for Rs.25, 000/- by cash for office use.
3. Show the Trial Balance and Balance Sheet of “Sagar Industries Ltd.”
4. Show the Vat Computation report of the above company.
5. Show the Cash Book & Bank Book of the company.
6. Show the Day Book.

Practical Assignment -2

1. Jyoti Printers over took all the printing Expenses is of Rs. 1500/-
2. Under packing Expense & from Hariom packing lmt. Rs. 5000/-
3. Kashav& brother’s help in fueling of Rs. 300/-
4. Com. open in Bank of India, an account with Rs. 100,000./-
5. From Ram lal& son’s 4000/- is to be taken of previous year.
6. Under Medical expenses we purchase Rs. 750/- Medical from Mahima Medical.
7. One NANO car of RS.1,25,000/- from TATA Moter’s.
8. From M/s R.K. Investment's we purchase share’s of SAMSUNG. of Rs.7500.
9. From Soni Brother’s Gold @ 35,000/- is purchased.
10. From XYZ & son’s Rs. 5000/- is due of previous year.
11. Payment is done to Hariom packing lmt. of Rs.3500/-.
12. Payment to Kulvinder& Son’s is done of Rs.2700/-
13. Payment to TATA Moter’s is done by D.D. Rs 1,25,000/- which is 1500/- bank commission paid by us. 14. From Arjun Ltd. 7000/- is to be taken of previous year.
15. Payment to Soni Brother’s has done by cheque of Rs. 35,000/-
16. From XYZ & son’s we received Rs. 5000/-
17. Payment to Jyoti Printer’s has been done by cheque.
18. Payment to Hariom packing lmt. we paid his whole amount by cheque

Practical Assignment -3 Payment &Receipts Voucher

1. Com. has opening cash Rs. 100000/-
2. Mr. Rajendra is the owner of the company his opening capital Rs. 2,00,000/-
3. Com. has to received from previous year. {1} VIKAS NAGAR - 75,000/- {2} HARISH KUMAR - 75,000/-
4. Com. paid for full charges Rs. 500/- in cash. 5. Com. purchase chairs in cash Rs. 2,000/.
5. Com. Received from Harish Kumar Rs. 25,000/- in cash.

6. Com. purchase packing material of Rs.5000/-
7. Paid to Vivek worker 25,000/- as a loan.
8. Com paid to Vivek worker Rs. 2,000/- in cash salary.
9. Com. Received from Vikas Nagar 35,000/- in cash.
10. Com. Purchase shares of Tata of Rs. 16,000/- in cash.
11. Com. paid Building Rent Rs. 35,000/- in cash.
12. Com. sales in cash Shares of Tata Rs. 26,000/- in cash.
13. Paid Mobile bill of Rs. 1250/- in cash.
14. Com. paid water bill Rs. 750/- & Electricity bill Rs. 4500/- in cash.
15. Com. Received from Vivek Worker Rs. 25,000/- in cash

Practical Assignment -4

- (1) Mr. RAJENDRA KUMAR is owner of the company his Capital opening balance is Rs. - 25,24,125/-
- (2). Company has taken Loan previous year, there opening Balance is (a). ICICI Bank - 5,67,124/- (b). HDFC Bank - 2,15,724/-
- (3). Com. has to Pay of previous year - (a). Kelash Chand & Com. - 5,00,000/- (b). SunjaySingh & Com. - 2,25,000/- (c). Singh & Com. - 2,25,000/-
- (4). Company has Opening Stock:- ITEM NAME Qun. Rate Unit 1. Ashirwad Aata(5kg) 490 50/- Pkt. 2. Ashirwad Aata(10kg) 513 95/- Pkt. 3. Swastik Aata (5kg) 123 51/- Pkt. 4. Swastik Aata (10kg) 50 95/- Pkt.
5. Madhushree Tea(50gm) 500 7/- Pkt.
6. Madhushree Tea(100gm) 1000 13.50/- Pkt.
7. Madhushree Tea(250gm) 700 31/- Pkt. 8. Madhushree Tea(500gm) 425 60/- Pkt.
9. Madhushree Tea(1Kg) 200 95/- Pkt. 10. Tata Tea (100gm.) 1000 13/- Pkt
11. Tata Tea(500gm.) 1000 75/- Pkt.
12. Zotex(100ml.) 2000 110/- Nos.
13. Spicy Cool(100ml) 300 85/- Nos.
14. Zotex(200ml.) 500 195/- Nos.
15. Java(50ml.) 200 45/- Nos. 16. Java(100ml.) 300 60/- Nos.
17. Axe(100ml.) 500 125/- Nos. 18. Axe(200ml.) 200 210/- Nos.
19. Rexsona(100ml.) 1000 135/- Nos.
20. Rexsona(200ml.) 500 225/- Nos.
21. Lux Soap(75gm.) 2500 9.75/- Nos.
22. Lux Soap(100gm.) 1500 14.13/- Nos.
23. Lux Soap(125gm.) 1000 15.50/- Nos.
24. Breez(100gm.) 5000 6.00/- Nos.
25. Dove Soap(100gm.) 500 21/- Nos.
26. Dove Soap(200gm.) 500 40/- Nos.
27. Pears Soap(100gm.) 225 25/- Nos.
28. Ni,a Soap(100gm.) 200 6.50/- Nos.
29. DabaurAwala(100ml.) 250 17/- Nos.
30. DabaurAwala(200ml.) 250 31/- Nos.
31. Paracute Oil (100ml.) 500 15/- Nos.
32. Paracute Oil (200ml.) 600 25/- Nos.
33. Shanti Awala(100ml.) 500 15/- Nos.
34. Vatika Hair Oil (100ml.) 250 61/- Nos.
35. SunsilkShempoo(100ml.) 50 20/- Nos.
36. SunsilkShempoo(200ml.) 50 51/- Nos.
37. Clinic Plus(100ml.) 100 30/- Nos.Cont 15
38. Clinic All Clear(100ml.) 100 35/- Nos.
39. Clinic All Clear(200ml.) 100 60/- Nos.
40. ChikShempoo(100ml.) 25 25/- Nos.
41. ChikShempoo(50ml.) 500 13/- Nos.
42. AyurShempoo(50ml.) 500 15/- Nos.

43. AyurShempoo(100ml.) 500 28/- Nos.
44. VatikaShempoo(100ml.) 200 40/- Nos.
45. VatikaShempoo(200ml.) 100 70/- Nos.
46. Parle-G(100gm.) 5000 3.88/- Pkt.
47. Parle-G(250gm.) 2000 12/- Pkt.
48. Krack Jack (100gm.) 1000 5.00/- Pkt.
49. Krack Jack(250gm.) 500 12/- Pkt.
50. Fair & Lovely(50gm.) 250 22/- Pkt.
51. Ayur Cold Creem(50gm.) 200 30/- Pkt. (5). Com. has some fixed Assets, there Opening balance:-
 - (i) Maruti Swift - 2, 13,232/-
 - (ii) Lang & Building - 13, 52,232/-
 - (iii) Furniture - 5,00,000/-

PRACTICAL LIST ON CLOUD COMPUTING

Suggested Practical for development of applications for following tasks/tools:

1. Any one Tool for IaaS
2. Any one Tool for PaaS
3. Any one Tool for SaaS
4. Any one Tool for Virtualization (VMware or Microsoft Hyper-V.)
5. Any one Tool for Cloud Service (Amazon Web Services or Microsoft Azure)

PRACTICAL LIST ON SOCIAL MEDIA MARKETING

1. Create and Promote Your Page on Facebook also add a Facebook Page Link to Your Important Contact Areas.
2. Create a Facebook Fan Page or a Group on Facebook for a hypothetical company.
3. Create a marketing plan driven by social media tools for a company of their choice. Within the plan, the student should decide what social media platform should be used, what content will be shared, and how much time should be allocated to each activity. Have students present their marketing plans to the class, including specific metrics they hope to achieve.
4. Each student should create a hypothetical business and design a landing page for the business's website. The landing page should have forms, graphics, and content that target a specific business objective. In a presentation, students should discuss how an individual would find this landing page, and why his or her landing page is optimized for conversion.
5. Email Marketing- Student Activity- Design Email Campaigns That Target Different Stages of the Sales Cycle.
6. Group Discussion - Website Ranking by Keyword in Google.

PROJECT WORK GUIDELINES

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
0	2/2	4/8	6/10	0	20	80	100

Guidelines for BCA Project

The Bachelor of Computer Applications (BCA) programme is designed with the objective to prepare the students to take up positions in IT industries as programmer, systems designers, software engineers, etc. The curricula are designed to provide students comprehensive knowledge covering the skills and core areas of computer science in theory and practical's. With the same objective six months major project is part of curricula in last semester of BCA. In the major project students are supposed to develop quality software solutions by applying theoretical and practical knowledge of various courses learnt.

Objectives

The objective of the project is to help the student develop the ability to apply theoretical and practical tools / techniques to solve real life problems related to industry, academic institutions and research laboratories. After completion of this project work, the student should be able to describe the Systems Development Life Cycle (SDLC) related to their project:

- Evaluate systems requirements.
- Evaluate a problem definition.
- Collect information to determine requirements.
- Perform and evaluate feasibility studies like cost-benefit analysis, technical feasibility, time feasibility and operational feasibility for the project.
- Work on data collection methods for fact finding.
- Construct and evaluate data flow diagrams.
- Construct and evaluate data dictionaries/ decision trees/ decision table.
- Create and evaluate graphical tools as systems flow charts, entity-relationship (er) diagrams and state transition diagrams.
- Preparation of Software Requirement Specifications (SRS) and hardware specifications.
- Plan the systems design phase of the SDLC.
- Identification of Functional & Non-functional design requirements.
- Design and evaluate system outputs.
- Design and evaluate systems inputs.
- Design and evaluate validity checks for input data.
- Design and evaluate user interfaces.
- Perform coding for the project.
- Prepare documentation of project
- Perform various testing techniques/strategies.
- Be able to generate various reports in project.
- Able to deploy the project on machine/lab/real time environment
- Identification of the maintenance procedures.
- To decide the future scope and further enhancement of the system.
- Plan for appendices (if any) to be placed in support with the project report documentation.

Types of Project

The majority of the students are expected to work on real-life project preferably in some industry/ research and development laboratories / educational institution / software company. However, it is not mandatory for a student to work on a real-life project. The student can formulate a project problem with the help of her/his supervisor and if approved, the student commences working on it.

Project Synopsis Format

The project proposal should be prepared in consultation with supervisor. Approval of the project proposal is mandatory to continue and submit the project work. The project proposal should clearly state the project objectives and the environment of the proposed project to be undertaken.

The project proposal should contain complete details in the following form:

- Title of the project
- Name of the supervisor (external supervisor(company)from / internal supervisor (teacher of the BCA))
- Introduction and objectives of the project
- Analysis (DFDs, ER diagrams, class diagrams, time line etc. As per the project requirements).
- A complete structure which includes:
 - Name of modules and their description
 - Database / data structures description
 - Process logic of each module(flow chart)
 - Reports generation. (report format)
 - Tools / platform, hardware and software requirement specifications
 - Organization/ company details with profile of supervisor (if project is carried out outside the department)

Project Work Guidelines

The project work should normally include software development.

Not more than two students are permitted to work on a project.

The project may be done in the university campus/concern study institute or in an approved sponsoring organization in view of the proposed topic.

A candidate is required to present the progress of the project work during the semester as per the schedule.

Project Report Preparation

Good quality white A4 size paper should be used for printing and duplication. Care should be taken to avoid smudging pages while duplicating the copies.

Page Size – A4 (21 cm x 29.7 cm) – Orientation – Portrait

Page Margins -Left Margin-3.0cm, Right Margin- 2.0 cm, Top Margin 2.54 cm, Bottom Margin 2.54 cm, Line Spacing – single, Font Name -Times New Roman/ Bookman Old Style

Font Size – 12 for normal text, 14 for headings, 16 for chapter heading,

Page Numbers - all text pages as well as program source code listing should be numbered at the bottom of the pages.

Software Used - MS-Word or Open Office or any other Open Source software.

The project report should contain the following:

1. Front page – Black color with golden or white text.
2. Certificate from the supervisor with her/his signature and date.
3. Certificate from company/industry in their letter head (if project is carried out outside the department)

4. Certificate of originality/ self-certificate
5. The project report documentation should include the following topics (as per the project requirements).
6. Acknowledgements
7. Table of contents / index with page numbering
8. Introduction / objectives of the project
9. System analysis
10. Feasibility study
11. Software and hardware requirement specifications
12. System design
13. Coding
14. Validation checks
15. Testing (testing techniques and testing strategies used along with the test data and the errors listed for each test case).
16. Reports, tables figures should be properly numbered/labeled
17. Screen shots of projects
18. Implementation and maintenance
19. Conclusion
20. Future scope and further enhancement of the project
21. Bibliography/ references
22. Appendices (if required)

A properly labeled and signed CD which contains the soft-copy of all the program's source code and executables, databases, reports, screenshots and documentation in MS Word / Libre & PDF format should be kept in a thick envelope and must be pasted inside of the back cover of the project report.

Two copies of the original project report in bound form are to be submitted. Each group is required to prepare individual copy of project report in CD and submit along with his/her project report in MS Word / Libre as well as PDF. The same must contain the report, results, screenshots, errors, databases, source codes (wherever it is not feasible explicit approval from the supervisor must be obtained).

Project Evaluation

Internal evaluation is done on the basis of following

- Project analysis & planning
- Project design & development
- Project testing & validation
- Project documentation
- Project presentation & viva

To fulfill the above three presentation must be carried out phase wise in the whole semester for internal assessment of the project.

The standard formats of the title cover of the project reports and other standard certificates are given ahead. All students are advised to use these formats to present their reports.

PROJECT REPORT ON

“.....TITLE OF THE PROJECT”

Submitted in partial fulfillment of the requirement
for the award of the degree
Bachelor of Computer Applications (BCA)

SESSION :20XX-20YY

Project Guided By:	Submitted By:
External Guide (if any) :	Name of Student
Internal Guide:	Enrollment No.
(BCA Faculty)	Roll No.
	Study Institute code No.
	Name of Students
	Enrollment No.
	Roll No.
	Study Institute code No.

Submitted to



**Makhanlal Chaturvedi National University of Journalism and
Communication, Bhopal**
<Name of Study Institute>

PROJECT CERTIFICATE

This is to certify that the project report entitled _____ submitted to MakhanlalChaturvedi National University of Journalism & Communication, in partial fulfillment of the requirement for the award of the degree of **Bachelor of Computer Applications(BCA)**, is original work carried out by myself Mr/ Ms _____ with enrolment no. _____ under the Supervision of Prof./Dr./Mr./Ms. _____. The matter embodied in this project is genuine work done by myself and has not been submitted whether to this University or to any other University / Institute for the fulfillment of the requirement of any course of study.

Date:

Name & Signature of the Student

Contact Details (Email, Phone & Address)

Verified by the Supervisor

Name & Signature of the Supervisor/s

Date:

ACKNOWLEDGEMENT

This Major Project is the result of contribution of many mind. I would like to acknowledge and thank my project guide..... (Faculty Name)for his/hervaluablesupport andguidance. He/she guided me through the process from conception and till the completion of this project. I would also like to thanks my class teacher/institute directorand my all my faculties..... I thank to lab staff members.....and other non-teaching members.

I am very thankful for the open-handed support extended by many people. While no list would be complete, it is my pleasure to acknowledge the assistance of my friends who provided encouragement, knowledge and constructive suggestions.

Signature of Student
(Name of student)
(Roll No -----)
(Enrollment No -----)

SELF-CERTIFICATE

This is to certify that the Major Project report entitled “-----” is done by me, and it is authentic work carried out for the partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Application(BCA) under the guidance of.....(Faculty name). The matter and software embodies in this project has not been submitted earlier for award of any degree or diploma to the best of my knowledge and believes.

Signature of Student

(Name of student)

(Roll No -----)

(Enrollment No -----)

CERTIFICATE FROM PROJECT GUIDE

This is certify that this Major Project entitled " _____ " submitted in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Application (BCA) in session (years 20__ to 20__) to the Makhanlal Chaturvedi National University of Journalism & Communication, Bhopal, done by _____ (student name) is an authentic work carried out by his/ them at "....." (study centre name /department name) (-----Place) under my guidance. The matter and software embodied in this project work has not been submitted earlier for the award of any degree or diploma to the best of my knowledge and belief.

Signature of BCA Teacher

(Project Guide)

