BIKANER TECHNICAL UNIVERSITY, BIKANER

PROGRAMME SCHEME & SYLLABUS

BCA **Syllabus 2024-25**

I & II Semester

Bikaner Technical University,

Bikaner

Bikaner Technical University, Bikaner

Bachelor of Computer Applications

Syllabus 2024-25

Note - Admission rules and other conditions to the course will be as per Government / University policy declared for undergraduate/postgraduate programs from time to time.

FIRST YEAR												
	Serial Number, Code & Nomenclature of Paper			**Teaching Hrs/ Week &**				**Distribution of Marks**			**Min. Pass Marks (%)**	
Year/ Semester	Subject Code	Course Type	Nomenclature	L	T	P	C	Internal Assessment	Semester Assessment	Total Marks	Internal Assess	Sem. Asses
I Year I Semester	BCA-101	DCC	Computer Fundamentals	3			3	30	70	100	36%	36%
	BCA-102	DCC	Web Application Development	3			3	30	70	100	36%	36%
	BCA-103	DCC	Programming with C Language	3			3	30	70	100	36%	36%
	BCA-104	DCC	Computer Architecture	3			3	30	70	100	36%	36%
	BCA-151	DCC	Computer Fundamentals Lab			2	2	30	70	100	36%	36%
	BCA-152	DCC	Web Application Development Lab			2	2	30	70	100	36%	36%
	BCA-153	DCC	C Programming Lab			2	2	30	70	100	36%	36%
	BCA-154	SEC	Soft Skills & Communication Lab			2	2	30	70	100	36% Non CGPA S/NS*	

I Year II Semester	BCA-201	DCC	Mathematical Fundamentals	3			3	30	70	100	36%	36%
	BCA-202	DCC	Database Management System	3			3	30	70	100	36%	36%
	BCA-203	DCC	Oops concepts with C++	3			3	30	70	100	36%	36%
	BCA-204	DCC	Data Structure	3			3	30	70	100	36%	36%
	BCA-251	DCC	DBMS Lab			2	2	30	70	100	36%	36%
	BCA-252	DCC	C++ Lab			2	2	30	70	100	36%	36%
	BCA-253	DCC	Data Structures using C Lab			2	2	30	70	100	36%	36%
	BCA-254	AECC	Human Values and Professional Ethics			2	2	30	70	100	36% Non CGPA S/NS*	

Note – 1 Practical Lab = 2 hours

AECC subject is Compulsory for all candidates. The passing mark will be 36%. Its marking will be S/NS*=Satisfactory or Unsatisfactory. It is a Non-CGPA Subject.

** A candidate shall be required to obtain 36% marks to pass in theory, practical, and internals separately.

● For Internal Evaluation of 30 Marks overall (no bifurcation into theory and practical)-please decide your criteria (Suggestive: 10 Marks for theory paper, 05 Marks for practical paper, 05 Marks for assignment/ seminar, and 10 Marks for Logical thinking/application of knowledge and skills)

● Each practical exam is to be conducted by two examiners one External and one Internal. The external examiner should be a senior lecturer from the jurisdiction of BTU, Bikaner. External Examiner will prepare question paper for Practical Examination. Students have to perform exercises on the computer. Exercise must be written in answer books in proper documentation.

● Bifurcation of 70 marks for Practical paper will be as follows- 3 practical questions 30 marks each Lab File: 10 marks Viva voce: 30 marks

Scheme of end-of-semester examination:

The Bachelor in Computer Applications (BCA) is of 6-semester duration full-time program. The program will have core courses, core electives, skill development, and elective open papers, a dissertation/project/training/review/clinical project/internship/case study in the 6th semester, and a combined practical paper based on theory papers in each semester. The dissertation/project/training/review/clinical project/internship/case study will be evaluated by an external examiner.

1. English shall be the medium of instruction and examination.
2. There will be a semester-end examination. The semester-end examinations, evaluation, publication of results, award of marks statements, and award of Degrees

shall be undertaken by BTU, Bikaner.

3. Any student who fails to participate in classes, viva voce, or practical work will be debarred from appearing in the end-semester examination.
4. The duration of the written examination for each paper shall be three hours and the Practical examination shall be for one-day duration.
5. The minimum attendance required by a candidate will be as per the University rules.
6. With regards to the Dissertation/project/training/review/clinical project/internship/case study, the scheme of evaluation shall be that the candidate has to submit a report/thesis/dissertation/case study in a spiral/bound form in three copies which would be evaluated by an external examiner. Total marks for Project/case studies/training/dissertation/internship shall be _
7. Award of degree, grading, scope for improvement/appeal – as per Bikaner Technical University rules and regulations/ordinances (CBCS/Semester). Pass Criteria
8. For passing each theory examination, a candidate is required to obtain 36% marks in all theory papers and 36% marks separately in the practical examination and internal and dissertation.

Pattern of Examination

A course will contain 5 units. The question paper shall contain three sections. Section A (10 marks) shall contain 10 questions two from each Unit. Each question shall be of 1 mark. All the questions are compulsory. The answers should not exceed 50 words.

Section B (25 marks) shall contain 5 questions (two from each unit with internal choice). Each question shall be of 5 marks. The candidate is required to answer all 5 questions. The answers should not exceed 200 words.

Section C (30 marks) shall contain 5 questions, one from each Unit. Each question shall be of 10 marks. The candidate is required to answer any three questions by selecting these three questions from different units. The answers should not exceed 500 words.

Model Paper for 70 marks Theory Paper

Bachelor of Computer Application
Semester I
Duration: 3 Hours Maximum Marks: 70
Exam- 2023-24

Instructions: The question paper shall contain three sections. Section A (10 marks) shall contain 10 questions two from each Unit. Each question shall be of 1 mark. All the questions are compulsory. The answers should not exceed 50 words. Section B (30 marks) shall contain 5 questions (two from each unit with internal choice). Each question shall be of 6 marks. The candidate is required to answer all 5 questions. The answers should not exceed 200 words. Section C (30 marks) shall contain 5 questions, one from each Unit. Each question shall be of 10 marks. The candidate is required to answer any three questions by selecting these three questions from different units. The answers should not exceed 500 words.

Section – A

[1 x 10 =10]

1. (a) …..…… from unit 1 ……..……

(b) ……from unit 1 ……..

(c) ……from unit 2 ……..

(d) ……from unit 2……...

(e) ……from unit 3……...

(f) ……from unit 3……...

(g) ……from unit 4……..

(h) ……from unit 4……..

(i) ……from unit 5……...

(j) ……from unit 5……...

Section – B

[6 x 5=30]

2. ……from unit 1……

or

3……from unit 1……..

4. ……from unit 2……

or

5……from unit 2……

6……from unit 3……

or

7……from unit 3……

8……from unit 4……

or

9……from unit 4……...

10……from unit 5…….

or

11……from unit 5…….

Part - C

[10 x 3=30]

12. ……from unit 1…….

13. ……from unit 2…….

14……from unit 3……...

15. ……..from unit 4……..

16. ……..from unit 5……..

BCA -101 : Computer Fundamentals

Unit-I

Introduction to Computer: Historical Evolution of Computers, Generation of Computers, Characteristics, Classification and Application of Computer, Block diagram, Basic Components of Computer System: Central Processing Unit, Memory Unit, Microprocessor; Various I/O Devices their Functions and Characteristics; Types of Memory (Primary & Secondary); Classifications of Printers

Unit-II

Introduction to Software: Definition of software, Classification of Software,
Programming Languages: Machine, Assembly, High Level Language, Compilers and Interpreter;
Overview of OS: Definition of OS, Functions of OS, basic concept of different type of OS, Concept of CUI & GUI, Installation of Windows operating System, Installation of Printer and Other Software Packages such as MS Office etc. Backup and Restore Operations. Features of Windows; Various versions of Windows, Desktop, Explorer, Searching, Recycle Bin, Settings using Control Panel, System Tools, Disk cleanup, defragmentation, scanning for virus, Windows Accessories.

Unit-III
MS Word: Word processing, MS- Word features, creating saving and opening in Word, interface, toolbars, ruler, menus, keyboard shortcut, editing, previewing, printing & formatting a document, advance features of MS Word, find & replace, using thesaurus, mail merge, handling graphics, tables, converting a Word document into various formats like-text, rich text format, Word perfect etc.

Unit-IV
MS Excel: Worksheet basics, creating worksheet, entering data into worksheet, data, text, dates, alphanumeric values saving & quitting worksheet, opening and moving around in an existing worksheet, Toolbars and menus, Keyboard shortcuts, Working with single and multiple workbook, working with formula & cell referencing, Auto sum, coping formulas, absolute and relative addressing, formatting of worksheet, previewing & printing worksheet, Graphs and Charts, Database, macros, multiple worksheet-concepts.

UNIT-V
Power Point: Creating and viewing a presentation, managing Slide Shows, navigating through a presentation, using hyperlinks, advanced navigation with action setting and action button, organizing formats with Master Slides, applying and modifying designs, adding graphics, multimedia and special effects.
Microsoft Access: Planning a database (tables, queries, forms, report), creating and editing database, customizing tables, linking tables, designing and using forms, modifying database, Sorting and Indexing database, querying a database and generating reports.

Reference Books:
1. Computer Fundamental By P.K. Sinha (BPB Publications)
2. Fundamentals of Computers By Balagurusamy E, Tata McGraw-Hill
3. Microsoft; 2007/2010 Microsoft office System; PHI.
4. Microsoft; Microsoft office 2007/2010; Plain & Simple; PHI
5. Rajaraman V. -Fundamentals of computers, Prentics hall of India.
6. Introduction to Computers with MS-Office-Leon, TMH

BCA -102 : Web Application Development

UNIT-I

Internet Basics: Introduction to Internet, History of Internet, Internet Working, Modes of Connecting to Internet, Internet Service Providers (ISPs), Differentiate between Internet, Intranet and Extranet.

World Wide Web: Introduction to www, Miscellaneous Web Browser details, searching www: Search engines and meta search engines, search fundamentals, search strategies, working of search engines, Telnet, FTP, HTTP, Introduction to Web Browsers.

Introduction to Domain Names, Domain Name Servers and DNS Lookup Process, ICANN and domain registration.

Web Hosting Fundamentals: Introduction to Web Hosting, Different Hosting Packages, Domain Registration, Configuring Name Servers, Navigating Control Panels, Setting Up Email Accounts in cPanel, Utilizing FTP Clients, Website Maintenance

UNIT-II

Introduction to HTML: Overview of HTML, History of HTML, HTML Editors, HTML Document Structure, DOCTYPE declaration, Anatomy of an HTML Tag, HTML Elements-Nested HTML Elements, Empty HTML Elements, HTML Attributes, HTML Character & Symbol Entities, Comments Tags;

Text Formatting: Headings, Paragraphs, Line Breaks, Emphasis (Bold, Italics), Quotations, Citations, Preformatted text, Colors and Styles;

Links: Anchor tags, Absolute and Relative URLs, Link attributes;

Images: Images and Image Mapping, Image attributes; **Lists**: Ordered and Unordered Lists, Definition Lists, Nesting lists, List attributes; **Tables**: Table structure, Table tags, Table attributes, HTML Layout Elements and Techniques; **Forms and IFrame**: Form tags, Input types, Form attributes, Form validation, embedding content with IFrame; HTML Graphics; HTML Media: Audio and Video tags, Embedding media, Media attributes, Controls, Accessibility;

Updates in HTML5. Meta tags and Open Graph Tags. Introduction to Onsite SEO – Optimizing keywords, page performance metrics, internal/external links, markup standards, URL structure, device responsiveness.

UNIT-III

Introduction to CSS: What is CSS, Importance of CSS, How CSS works, Inline CSS, Internal CSS, External CSS, CSS Color, Font, Sizes, CSS Border, CSS Padding, CSS Margins, Block Level Elements and Inline Elements, Class, ID, DIV, SPAN, Gradients, animations, transitions. CSS3 and new features: CSS Variables and Various measurement units. Flexbox, Media Queries. Building responsive and personalized user experiences through CSS. Optimizing CSS rendering. Introduction to CSS Sprites. Introduction to CSS Frameworks and Component Libraries, Comparison between Bootstrap and Tailwind. Introduction to SCSS

UNIT-IV

JavaScript Essentials: Overview of Client-Side Scripting and JavaScript, Basics of JavaScript including Comments, Variables, and Global Variables. Data Types, Operators, and Conditional Statements (If, If Else, Switch). JavaScript Loops: For Loop, While Loop, Do While Loop. JavaScript Interactions: Popup Boxes (Alert, Prompt, Confirm), Events, Arrays, and Objects. The JavaScript Object Model, Form Development and Validation, Managing Cookies, and JavaScript Security. Frame Management in JavaScript. JavaScript APIs: Utilizing Web Storage, Geolocation, and Web SQL Databases.

UNIT-V

Introduction to API First Development: HTTP Headers & Methods, Introduction to RESTful Framework, Examples of public RESTful APIs. Sending queries to RESTful APIs through Browser Developer Tools and third-party tools (such as Postman). Overview of Microservices architecture.

Asynchronous execution in JavaScript: Introduction to promises and workers, async-await, service workers, cache. Reading data from server through JavaScript asynchronous methods – XML, HTTPRequest and Fetch.

Introduction to Ajax: Introduction, advantages &disadvantages, Purpose of it, ajax based web application, alternatives of AJAX

Java Script & AJAX: Introduction to array-operators, making statements-date & time-mathematics strings-Event handling-form properties. AJAX. Introduction to jQuery. to modern frontend JS frameworks, Comparison between ReactJS and AngularJS.

Reference Books:

1.HTML, DHTML, JavaScript, Perl, CGI, Ivan Bayross, BPB Publication.
2.HTML Complete Reference, BPB Publication.
3. Ajax: The Definitive Guide, O'Reilly, Anthony T. Holdener III
4.Internet for everyone, Alexis Leon and Mathew Leon, Leon Tech world.
5. Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp – 2001, TMH
6. Internet & World Wide Programming, Deitel,Deitel & Nieto, 2000, Pearson Education

BCA-103: Programming with C Language

Unit-I

Introduction to C: History of C, Overview of Procedural Programming, Using main() function, Compiling and Executing Simple Programs in C.

Data Types, Variables, Constants, Operators and Basic I/O: Declaring, Defining and Initializing Variables, Scope of Variables, Using Named Constants, Keywords, Data Types, Casting of Data Types,

Operators (Arithmetic, Logical and Bitwise), Using Comments in programs, Character I/O (getc, getchar, putc, putchar etc), Formatted and Console I/O (printf(), scanf()), Using Basic Header Files (stdio.h, conio.h etc).

Unit-II

Expressions, Conditional Statements and Iterative Statements: Simple Expressions in C (including

Unary Operator Expressions, Binary Operator Expressions), Understanding Operators Precedence in Expressions, Conditional Statements (if construct, switch-case construct), Understanding syntax and utility of Iterative Statements (while, do-while, and for loops), Use of break and continue in Loops, Using Nested Statements (Conditional as well as Iterative)

Unit-III

Functions and Arrays: Utility of functions, Call by Value, Call by Reference, Functions returning value, Void functions, Inline Functions, return data type of functions, Functions parameters, Differentiating between Declaration and Definition of Functions, Command Line Arguments/Parameters in Functions, Functions with variable number of Arguments.

Creating and Using One Dimensional Arrays (Declaring and Defining an Array, Initializing an Array, accessing individual elements in an Array, manipulating array elements using loops), Use Various types of arrays (integer, float and character arrays / Strings) Two- dimensional Arrays (Declaring, Defining and Initializing Two-Dimensional Array, Working with Rows and Columns), Introduction to Multi-dimensional arrays

Unit-IV

Derived Data Types (Structures and Unions): Understanding utility of structures and unions, declaring, initializing and using simple structures and unions, manipulating individual members of structures and unions, Array of Structures, Individual data members as structures, Passing and returning structures from functions, Structure with union as members, Union with structures as members.

Pointers in C: Understanding a Pointer Variable, Simple use of Pointers (Declaring and Dereferencing Pointers to simple variables), Pointers to Pointers, Pointers to structures, Problems with Pointers, passing pointers as function arguments, returning a pointer from a function, using arrays as pointers, Passing arrays to functions. Pointers vs. References, Declaring and initializing references, Using references as function arguments and function return values.

Unit-V

Memory Allocation in C: Differentiating between static and dynamic memory allocation, use of malloc, calloc and free functions, storage of variables in static and dynamic memory allocation.

File I/O, Preprocessor Directives: Opening and closing a file, Reading and writing Text Files, Using put(), get(), read() and write() functions, Random access in files, Understanding the Preprocessor Directives.

Reference Books:

1. Programming in ANSI C, E. Balagurusami, Fourth Edition, Tata McGraw Hill.
2. Programming in C, Third Edition, Stephen G Kochan, Pearson.
3. The C Programming Language, Kernighan & Richie, Second Edition, PHI Publication.
4. Let us C, Yashvant P Kanetkar, Seventh Edition, BPB Publications, New Delhi
5. Programming in C, Byron S. Gottfried, Second Edition, McGraw Hills.
6. Problem Solving and Programming in C, R.S. Salaria, Second Edition

BCA-104: Computer Architecture

UNIT- I

Components of a Computer: Processor, Memory, Input-Output Unit, Difference between Organization and Architecture, Hardware Software Interaction.

Number System: Concept of Bit and Byte, types and conversion. Complements: 1's complement, 2's complement.

Binary Arithmetic: Addition, Subtraction.

UNIT-II

Logic gates: AND , OR , NOT, NAND ,NOR ,EXOR , EX-NOR with Truth tables

Boolean Algebra, Map Simplification. Combinational circuits: Half Adder, Full Adder, Decoders, Multiplexers. Sequential circuits: Flip Flops- SR, JK, D, T Flip-Flop.

UNIT-III

Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Mode, Data Transfer and Manipulation, Program Control.

RISC And CISC Architecture

UNIT-IV

Input Output Organization: Peripheral devices, I/O Interface, Asynchronous Data Transfer, Modes of Data Transfer, Direct Memory Access, I/O Processor.

UNIT-V

Memory Organization: Memory System: Memory Hierarchy, Semiconductor Memories, RAM(Random Access Memory), Read Only Memory (ROM), Types of ROM, Cache Memory, Performance considerations, Virtual memory, Paging, . I/O interface, Programmed IO, Memory Mapped IO, Interrupt Driven IO, DMA, IOP input – output processor, Introduction to DMA

Reference Books:

1. Computer System Architecture, By M. Morris Mano (Pearson, Prentice Hall)
2. Carter Nicholas, “Computer Architecture”, Schaun outline Sevies , Tata McGraw Hill.
3. J.P. Hayes, “Computer Architecture & Organization”, Tata McGraw Hill
4. Digital Computer Electronics By Malvino Leach, Jerald A. Brown(McGraw Hill)

BCA -151: Web Application Development Lab

HTML:

1. Basics Elements & Attributes, HTML Formatting tags, Links,
2. Images, Tables, Forms Elements
3. HTML5 Audio and Video, HTML5 Input Types & Attributes
4. CSS Syntax, CSS Attribute Selectors
5. CSS properties: Fonts, Background, Colors, Links, Lists,
6. CSS Box Model, Display, Opacity, Float, Clear
7. CSS Layout, CSS Navigation Bar,
8. CSS Rounded Corners, CSS Border Images, CSS Animations
9. Implement HTML5 specific tags like <article>, <section>, <nav>, and <footer>.
10. Use meta tags and Open Graph tags to enhance webpage metadata.

JavaScript:

1. Displaying Output, Declaring Variables, Operators, Arithmetic, Data Types, Assignment,
2. JavaScript Functions, Booleans, Comparisons, Conditional,
3. JavaScript Switch, Loops, Break, Type,
4. JavaScript Objects, Scope,
5. Strings and String Methods
6: Numbers and Number Methods, Math, JavaScript Dates: Formats and Methods.
7. JavaScript Events, API and Validation, Objects,
8. JavaScript Functions, JavaScript DOM, JavaScript Validation, Browser BOM
9. Create forms and validate them using JavaScript.
10. Make calls to RESTful APIs using fetch and AJAX.
11. Implement promises, async-await, and service workers in web applications.

Web Hosting and Maintenance:

1. Set up a domain, configure name servers, and navigate a hosting control panel.
2. Use FTP clients for website maintenance and email setup.

Capstone Project: Implement a comprehensive web application to apply all web programming learnings, such as creating a "Community Event Planner" or an "Online Bookstore" using HTML, CSS, JavaScript, and API integrations.

BCA -152: Office Application Lab

1. Bio-data Preparation using MS-Word.
2. Design a department invitation using formatting option.
3. Insert picture in right side and related information in left side using page layout option in MS-Word.
4. Application of text manipulation and mathematics equation with scientific notations.
5. College class Time Table using table option in MS- Word.
6. Student Marks Analysis Table using table option in MS- Word.
7. Student Marks Analysis Table and apply formula to Total, Average using formula function in MS- Word. And then convert the Student Mark Table into text using convert option in MS- Word.
8. Student Marks Statement letter and merge the draft with student's academic database using mail merge on a letter head in MS-Word.
9. Flowchart to find sum of two numbers using drawing toolbars in MS-Word.
10. Flowchart for course chart using drawing toolbars in MS-Word.
11. Use of Formulas Sum, Average, If, Count, Counta, Countif & Sumif
12. Create an excel worksheet of your own and insert data. Then create a Pie chart for the data.
13. Create an excel worksheet of your own and insert data. Then create a line chart for the data.
14. Create an excel worksheet of your own and insert data of students with their percentage of marks. Now implement conditional formatting to distinguish students percentage like the following. (percentage>=60 Green. percentage>=45 Yellow, percentage<34 RED)
15. Create an excel worksheet of your own and insert student data in it. Now implement freeze pane to lock column heading, and student roll and name.
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BCA -153: C Programming Lab

Objective: To develop skills in implementing logics for getting the desired outputs through C programming languages and to explore the features of C programming language.

I/O Statements Entering input data, writing output data, gets and puts functions –Arithmetic and Logical operators – expressions, conditional statements, Looping Control Statements Implementation of programs using control statements.
Functions and Arrays Accessing a function – passing arguments to a function – recursive function. Processing an array – passing arrays to a function. – processing of strings.
Structure and Union: Implementation of programs using struct and union
File Handling Accessing a structure – processing using structure – Opening and closing a data file – creating a data file – processing a data file – unformatted data files.

At least 4 programs must be given as lab exercise from Unit 1 to Unit 5.

BCA-154: Soft Skills & Communication Lab

UNIT I: SELF DEVELOPMENT

Self-Management: Self-Evaluation, Self-Discipline, Self-Criticism, Self Awareness, Positive Thinking, Perceptions and Attitudes, Values and Belief Systems, Personal success factors, Handling failure, Knowing Yourself, identifying one's strengths and weaknesses.

Activity:

1. Student will describe about him/herself along with their strength and weakness.
2. Students should write their short term and long term goals.

UNIT II: COMMUNICATION SKILLS

Communication: Significance of Communication, types, barriers of communication, effective communication, Verbal and non-verbal Communication. Listening Skills: Virtues of Listening, Barriers and filter; Fundamentals of Good Listening. Reading Skills: Comprehension, reading research papers; Communication in Digital World. Speaking Skills: Importance of speaking effectively, speech process, Style, conversation and oral skills, fluency and self expression, body language phonetics and spoken English, speaking techniques, word stress, voice quality, correct tone, positive image projection techniques, Public Speaking, Group discussion.

Activity:

1. Group discussion on current affairs. (at least 2 topics)
2. Students have to listen carefully each discussion and prepare a summary for it.

UNIT III: LANGUAGE AND WRITING SKILLS

Business Writing: Note Making, Letter writing, Writing Formal Letters. Technical Report Writing, Agenda and Minutes of a Meeting, E-Mail. Employment Communication: Job Application, Preparation of CV and Resume writing. Presentation skills: Professional Presentation, Planning a Presentation, Preparing the Presentation, Delivering the Presentation.

Activity:

1. Prepare a report for an IT project.
2. Write a job application and prepare your resume for the same.

UNIT IV: LEADERSHIP AND TEAM BUILDING

Leader and Leadership, Culture and Leadership: Salient Features of Corporate Culture, Leadership Styles, Leadership Trends, team Building: Team Development Stages, Managing self – emotions, ego, pride, stress; Confidence building emotional empathy and emotional intelligence.

Activity:

1. Teacher should split students into small groups and have them develop a product, logo, brand name and marketing strategy.
2. Students have to write down 5 positive points in their personality.

UNIT V: INTERVIEW AND MEETING SKILLS

Interview Skills: concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conferencing and video-conferencing. Meetings: making meeting effective, chairing a meeting, decision-making, seeking opinions, interrupting and handling interruptions, clarifications, and closure.

Activity:

1. Organizing mock interviews for the students.
2. Organizing mock meetings for the students.

Reference Books:

1. Fluency in English - Part II, Oxford University Press, 2006.
2. Business Communication and Report Writing- Sharma, TMH.
3. English for technical Communication – Laxminarayana, Seitech.
4. Business Communication – Kaul, PHI.
5. Communication Skill – Ghanekar, EPH
6. English for the secretary- Yvonne Hoban – TMH
7. English Phonetics –Balashubrahmaniam.

I Year II Semester	BCA-201	DCC	Mathematical Fundamentals	3			3	30	70	100	36%	36%
	BCA-202	DCC	Database Management System	3			3	30	70	100	36%	36%
	BCA-203	DCC	Oops concepts with C++	3			3	30	70	100	36%	36%
	BCA-204	DCC	Data Structure	3			3	30	70	100	36%	36%
	BCA-251	DCC	DBMS Lab			2	2	30	70	100	36%	36%
	BCA-252	DCC	C++ Lab			2	2	30	70	100	36%	36%
	BCA-253	DCC	Data Structures using C Lab			2	2	30	70	100	36%	36%
	BCA-254	AECC	Human Values and Professional Ethics			2	2	30	70	100	36% Non CGPA S/NS*	

BCA-201: Mathematical Fundamentals

UNIT-I

Proposition, Logical operators, conjunction, disjunction, negation, conditional and bi-conditional operators, converse, Inverse, Contra Positive, logically equivalence, tautology and contradiction. Arguments and validity of arguments.

UNIT-II

Sets: Set operations, Properties of sets, number of elements in a set, Cartesian product, Venn diagram, Principle of Inclusion and Exclusion.
Relations: Types of Relations, Partial Ordered Relation, Equivalence relation.
Functions: Domain and Range of Function, Types of Functions, One-One and Onto Function, Composition of Functions.

UNIT-III

Types of Binary Operations: Commutative, Associative, Distributive and identity,
Boolean algebra: simple properties. Permutations and Combinations.

UNIT-IV

Matrix: Type of matrices, Addition, Subtraction and Multiplication of matrices, Singular and Non-Singular matrices, Adjoint of a Matrix, Inverse of a matrix, Solution of Simultaneous Linear equations by (i) Cramer's rule. (ii) Matrix Inversion Method.

UNIT-V
Statistics: Data Collection Methods, Data Classification, Frequency distribution,
Measures of Central Tendencies, Mean, Mode and Median,
Measures of Dispersions, Mean deviation, Standard Deviation, Variance,
Measure of Karl Pearson's coefficient of correlation.

Suggested Books

1. C. L. Liu – Elements of Discrete Mathematics, TMH
2. R. D. Sharma - Basic Mathematics
3. S. P. Gupta – Statistical Methods, Sultan Chand & Sons
4. U. Rizwan, Mathematical Foundation - SciTech, Chennai

BCA-202: Database Management System

UNIT-I
Data, Database, Database management system, Characteristics of the database approach, Role of Database administrators, Role of Database Designers, End Users, Advantages of Using a DBMS and When not to use a DBMS.Data Models – Categories of data models, Schemas, Instances, and Database states. DBMS Architecture and Data Independence – The Three schema architecture, Data independence .DBMS Languages and Interfaces.Classifications of Database Management Systems.

UNIT-II
Data Modeling Using Entity-Relationship Model, Using High Level Conceptual Data Models for Database Design, Example Database applications. Entity types, Entity Sets, Attributes and Keys. Relationships, Relationship types, Roles and Structural constraints. Weak Entity Types and Drawing E- R Diagrams.Index Structures for Files,Single Level Ordered Indexes – Primary indexes, Clustering indexes and Secondary indexes. Multi-level indexes, Hashing concepts.

UNIT-III
Relational Data Model,Relation, Integrity constraints - domain, entity and Referential integrity constraints, Basic Relational Algebra operations, select, project and join operations.Database Design,Functional dependencies and Normalization for Relational Databases- Normalization concepts, first,second, third normal forms, Boyce-Codd normal form.

UNIT-IV
SQL data definition and data types, specifying constraints in SQL, schema change statements, Basic queries, More Complex SQL queries, INSERT, DELETE and UPDATE statements in SQL, Views – Concept of a view in SQL.Transaction Processing Concepts and Concurrency Control Techniques Transaction and System concepts – Desirable properties of Transactions – Schedules and Recoverability. Lock-Based Protocols – Locks, Granting of Locks, and Two phase locking protocol and implementation of locking.

UNIT-V
Data Base Administration Introduction to Database security issues, Discretionary Access Control Based on Granting/Revoking of Privileges and Multi-level security. Database Recovery, Recovery Concepts: Recovery Outline and Categorization of Recovery Algorithms, Caching Buffering of Disk Blocks, Write-Ahead Logging, Steal/No-Steal, and Force/No-Force, Checkpoints in the System log and Fuzzy Check pointing, Transaction Rollback.

Suggested Books

1.ElmasriRamez and NavatheShamkant B, Fundamentals of Database Systems, AddisonWesley, 6th Edition, 2010.
2.Silberschatz, Korth, Sudarshan, Database System Concepts, 5 Edition, McGraw Hill, 2006.
3.O`neil Patricand, O`neil Elizabeth, Database Principles, Programming and Performance, 2nd Edition, Margon Kaufmann Publishers Inc, 2008.

BCA-203: Oops concepts with C++

UNIT-I

Basic concept of OOP, Comparison of Procedural Programming and OOP, Benefits of OOP, C++ compilation, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C and C++.

UNIT-II

Elements of C++ Language Tokens and identifiers: Character set and symbols, Keywords, C++ identifiers; Variables and Constants: Integer, character and symbolic constants; Dynamic initialization of variables, Reference variables, Basic data types in C++, Streams in C++.Operators, Types of operators in C++, Precedence and associativity of operators, Manipulators.

UNIT-III

if statement, if-else statement, switch statement, Loop: while, do-while, for; Jump statements: break, continue, go to, Arrays, pointers, structures, unions;main() function, components of function: prototype, function call, definition, parameter; passing arguments; types of function, inline function, function overloading.

UNIT-IV

Classes in C++, class declaration, declaring objects, Defining Member functions, Inline member function, Array of objects, Objects as function argument, Static data member and member function, Friend function and friend class, Constructors, Instantiation of objects, Default constructor, Parameterized constructor, Copy constructor and its use, Destructors, Constraints on constructors and destructors, Dynamic initialization of objects.
Overloading unary operators: Operator keyword, arguments and return value; overloading unary and binary operators: arithmetic operators, manipulation of strings using operators; Type conversions.

UNIT-V

Derived class and base class: Defining a derived class, Accessing the base class member, Inheritance: multilevel, multiple, hierarchical, hybrid; Virtual base class, Abstract class, Virtual functions, pure virtual functions; Polymorphism, Categorization of polymorphism techniques: Compile time polymorphism, Run time polymorphism, File classes, Opening and Closing a file, File modes, Manipulation of file pointers, Functions for I/O operations.

Suggested Books

1. E. Balagurusamy, Object-Oriented Programming with C++, TATA Mc Graw- Hill publishing.
2. Herbert Schildt, C++ The Complete Reference, Fourth Edition, Tata McGraw Hill Publication.
3. Deitel and Deitel, C++ How to Program, Third Edition, Pearson Publication.
4. Joyce Farrell, Object-oriented programming using C++, Fourth Edition, Cengage Learning.
5. K.R.Venugopal: Mastering C++, McGraw-Hill Education

BCA-204: Data Structure

UNIT-I

Introduction to data structures- Arrays and Structures: Abstract Data Type, Array in C, Dynamically Allocated Arrays, Structures, Unions, Internal Implementation of Structures, Self-Referential Structures, Polynomial Representation, Polynomial Additions.-sparse matrix

UNIT-II

Linear Search, Iterative Binary Search, Recursions, Recursive Binary Search, Bubble Sort, Insertion Sort, Selection Sort, Quick Sort, Merge Sort. String Abstract Data Type, String in C, Pattern Matching.

UNIT-III

Stacks- stacks using dynamic arrays- queues – circular queue using dynamic arrays- Evaluation of Expressions, Evaluating Postfix Expressions, Infix to Postfix

UNIT-IV

Pointers, Using Dynamically Allocated Storage, Singly Linked Lists, Dynamically Linked Stacks and Queues, Polynomials, Representing Polynomials as Singly Linked Lists, Adding Polynomials, Erasing Polynomials, Polynomials as Circularly Linked Lists, Doubly Linked Lists.

UNIT-V

Introduction, Terminology, Representation of Trees, Binary Trees, Properties of Binary Trees, Binary Tree Representations, Binary Tree Traversals Binary Search Trees Binary Search Tree, Inserting an Element, Deleting an Element, Height of Binary Search Tree,Introduction, Graphs— Introduction-Definition-representation-Depth first search-Breadth first search

Suggested Books

1. Classic Data Structure , P. Samanta , PHI , 2/ed.
2. Thomas H.Cormen,Chales E.Leiserson,Ronald L.Rivest, Clifford Stein, “Introduction to Algorithms”, Third Edition, Mcgraw Hill.2009.
3. Aho, Hopcroft and Ullman,”Data Structures and Algorithms”,Pearson Education,2003.
4. Data structure By Lipschutz (Tata McGraw Hill)
5. Data Structure By YashvantKanitkar (BPB)
6. An Introduction to Data Structures with Applications, By Jean-Paul tremblay, Paul

BCA-251: DBMS Lab

Exercise: I
1. Creating relevant tables with proper constraints.

Exercise: II
1. Implementing Select queries with Where clause
2. Implementing Select queries with sort using order by clause
3. Implementing Select queries with inner join.
4. Implementing Select queries with outer join.
5. Implementing Select queries with self join.
6. Implementing Select queries with subqueries.
7. Implementing Select queries with builtin numerical function.
8. Implementing Select queries with builtin string function.
9. Implementing Select queries with builtin date function.
10. Implementing queries to altering the structure of the tables by adding new columns.
11. Implementing queries to altering the structure of the tables by changing existing columns.
12. Implementing queries to change the values in the columns.
13. Implementing queries to enable or disable constraints.
14. Implementing queries to delete the unwanted values.
15. Implementing queries to drop tables.

The questions will be based on the following domains:
1. Student Information System
2. Railway Reservation System
3. Book Publishing System
4. Hospital Management System.
5. Bank Management System.

BCA-252: C++ Lab

Objective: To develop Object Oriented Programming skills by implementing OOPs concepts using C++ programming language for getting the desired outputs and to explore the features of C++ programming language.

I/O Statements Entering input data, writing output data, Arithmetic and Logical operators, mathematical expressions, conditional statements, Looping and its implementation, Control Statements, Functions and passing arguments in the functions, recursive function, Arrays, Processing an array – passing arrays to a function. – processing of strings.

Classes and its implementations, constructor and destructor, inheritance and its types, function overloading and operator overloading, virtual functions

Structure and Union: Implementation of programs using struct and union

File Handling Accessing a structure – processing using structure – Opening and closing a data file – creating a data file – processing a data file – unformatted data files.

At least 4 programs must be given as lab exercise from Unit 1 to Unit 5.

BCA-253 Data Structures using C Lab

Objective: To develop understanding of different data structures and programming skills by implementing its basic functionalities for getting the desired outputs through C programming languages.

Arrays and its types, Implementation of 2D & 3D arrays, String Arrays, Sorting
Pointers, Array of Pointers, Pointer to an Array,
Implementation of Stack and Queue using array,
Linked list (singly and doubly), circular linked list,
Binary Tree, Tree Traversal

At least 4 programs must be given as lab exercise from Unit 1 to Unit 5.

BCA-254 Human Values and Professional Ethics

UNIT I: SELF DEVELOPMENT

Self-Management: Self-Evaluation, Self-Discipline, Self-Criticism, Self Awareness, Positive Thinking, Perceptions and Attitudes, Values and Belief Systems, Personal success factors, Handling failure, Knowing Yourself, identifying one's strengths and weaknesses.

Activity:

3. Student will describe about him/herself along with their strength and weakness.
4. Students should write their short term and long term goals.

UNIT II: COMMUNICATION SKILLS

Communication: Significance of Communication, types, barriers of communication, effective communication, Verbal and non-verbal Communication. Listening Skills: Virtues of Listening, Barriers and filter; Fundamentals of Good Listening. Reading Skills: Comprehension, reading research papers; Communication in Digital World. Speaking Skills: Importance of speaking effectively, speech process, Style, conversation and oral skills, fluency and self expression, body language phonetics and spoken English, speaking techniques, word stress, voice quality, correct tone, positive image projection techniques, Public Speaking, Group discussion.

Activity:

3. Group discussion on current affairs. (at least 2 topics)
4. Students have to listen carefully each discussion and prepare a summary for it.

UNIT III: LANGUAGE AND WRITING SKILLS

Business Writing: Note Making, Letter writing, Writing Formal Letters. Technical Report Writing, Agenda and Minutes of a Meeting, E-Mail. Employment Communication: Job Application, Preparation of CV and Resume writing. Presentation skills: Professional Presentation, Planning a Presentation, Preparing the Presentation, Delivering the Presentation.

Activity:

3. Prepare a report for an IT project.
4. Write a job application and prepare your resume for the same.

UNIT IV: LEADERSHIP AND TEAM BUILDING

Leader and Leadership, Culture and Leadership: Salient Features of Corporate Culture, Leadership Styles, Leadership Trends, team Building: Team Development Stages, Managing self – emotions, ego, pride, stress; Confidence building emotional empathy and emotional intelligence.

Activity:

3. Teacher should split students into small groups and have them develop a product, logo, brand name and marketing strategy.
4. Students have to write down 5 positive points in their personality.

UNIT V: INTERVIEW AND MEETING SKILLS

Interview Skills: concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conferencing and video-conferencing. Meetings: making meeting effective, chairing a meeting, decision-making, seeking opinions, interrupting and handling interruptions, clarifications, and closure.

Activity:

3. Organizing mock interviews for the students.
4. Organizing mock meetings for the students.