RAJASTHAN TECHNICAL UNIVERSITY, KOTA

BCA: First Year Syllabus

Effective from academic session 2024-25

Course Code BCA-101 **Course Credit: 4.0** **Total No. of lectures allocated: 40** **Time: 3 Lecture hours + 1 Tutorial per week**	**Course Name:** Computer Fundamentals & C Programming
Course Objectives	• Explain the basic concepts of computer and its organization. • Describe the notion of computer's memory and Programming. • Discuss the basics of C Programming • Explain concept of linear data structures like array, structures and Union in C • Build foundation for understanding further computer application concepts • Create perception of designing, and developing small applications in C
Learning Outcomes	• Understand basic concepts of Computer and its organization. • Study essentials of computer's memory and Programming • Identifying essential C programming concepts • Develop programs in C • Implement applications of linear data structures like array, structures and Union in C • Design and develop small applications in C

Unit	Contents	Lectures
I	**Introduction to Computers** Introducing and Interacting with Computers, Computer Generations, Computer Organization, IO Devices, Number System, Computer codes, Computer Arithmetic and Boolean Algebra.	8
II	**Introduction to Memory and Languages** Processor And Memory, Types of Storage Devices, Computer Software and types, Basics of Programming, Programming Languages. Language Elements, Algorithms and Flowcharts.	8
III	**Introduction to C Programming** History, Execution of C Program, Constants, Variables and Keywords, Data types, Expressions, constants, variables, Operators, Operator Precedence and associatively, data input and output, Formatted Console I/O Functions, Conversion Specifications, assignment statements, conditional statements, Looping Statements, Storage Classes	8
IV	**Functions and Arrays** **Functions:** Introduction to Function, Functions with Simple Output Parameters, Passing Values between Functions, Multiple Calls to a Function. **Arrays:** Declaring and Referencing Arrays, Array Subscripts, Using for Loops for Sequential Access, Multidimensional Arrays, Passing arrays as arguments.	8
V	**Pointers, Structures & Unions.** Introduction to Pointers, Parameter Passing by Value v/s Parameter Passing by Reference. Structures & Unions- definition, Processing structures – Passing structures to a function. Pointers: Pointer Declaration, Pointer Initialization, Referencing & Dereferencing Pointers, Operations on Pointers.	8

References:	**Text Books:** 1. Reema Thareja, "Computer Fundamentals and Programming in C", Oxford University Press, 2023. 2. E. Balaguruswamy, " Computing Fundamentals and C Programming", McGraw Hill Education, 2nd , 2017. 3. Pradeep K Sinha, Priti Sinha, "Computer Fundamentals", BPB Publications, 6th Edition, 2010. 4. Bayron Gottfried, "Schaum's Outline of Programming with C", 4th Edition, 2018. **Reference Books:** 1. Yashvant Kanetkar, "Let Us C", BPB Publications, 19th Edition, 2022. 2. Sudeep R. Prasad, K.R Venugopal, "Mastering C", McGraw Hill Education, Second Edition, 2017. . 3. Kernighan and Ritchie, "The C Programming Language", Prentice Hall, 2015.

Course Code BCA-102	**Course Name:** Web Application Development
Course Credit: 4.0	
Total No. of lectures allocated: 40	
Time: 3 Lecture hours + 1 Tutorial per week	
Course Objectives	• To understand Web based programming and scripting languages. • To learn the basic web concepts and to create rich internet applications that use most recent client-side programming technologies. • To learn the basics of HTML, DHTML, CSS and Java Script.
Learning Outcomes	• Ability to Develop and publish Web pages using Hypertext Markup Language (HTML). • Ability to optimize page styles and layout with Cascading Style Sheets (CSS). • Ability to Understand, analyze and apply the role of languages to create a capstone. • Website using client-side web programming languages like HTML, DHTML, CSS and JavaScript.

Unit	Contents	Lectures
I	**Introduction to Internet** The basics of Internet, World Wide Web, Web page, Home page, Web site, Static, Dynamic and Active web page, Overview of Protocols – Simple Mail Transfer Protocol, Gopher, Telnet, Emails, TFTP, Simple Network Management Protocol, Hyper Text Transfer Protocol, Client server computing concepts.Web Browser, Browsers e.g., Netscape navigator, Internet Explorer, Mozilla Firefox,	8
II	**Introduction to HTML** Introduction to HTML, Essential Tags, Tags and Attributes, Text Styles and Text Arrangements, Text, Effects, Exposure to Various Tags (DIV, MARQUEE, NOBR, DFN, HR, LISTING, Comment, IMG), Color and Background of Web Pages, Lists and their Types, Attributes of Image Tag, Hypertext, Hyperlink and Hypermedia, Links, Anchors and URLs, Links to External Documents, Different Section of a Page and Graphics, Footnote and eMailing	8
III	**Introduction to Tables, Link and frames** Handling Tables: To define header rows & data rows, use of table tag and its attributes. Use of caption tag Linking Documents: Concept of hyperlink, types of hyperlinks, linking to the beginning of document, linking to a particular location in a document, Images as hyperlinks Frames: Introduction To frames, using frames & frameset tags, named frames how to fix the size of a frame, targeting named frames.	8
IV	**Introduction to CSS** Dynamic Web page Development Cascading Style Sheet: CSS, Defining Style with HTML Tags, Features of Style Sheet, Style Properties, Style Classes, types of Style Sheets.	8
V	**Introduction to Java Script** Introduction to JavaScript: Writing First Java Script, External JavaScript, Variables: Rules for variable names, Declaring the variable, Assign a value to a variable, Scope of variable, Using Operators, Control Statements, JavaScript loops, JavaScript Functions: Defining a Function, Returning value from function, User define function..	8

References:	**Text Books:** 1. Mike Mcgrath, "Java Script in easy steps", Dream Tech Press,6th Edition 2020. 2. Ivan Bayross,"Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI" ,BPB publication,4th Edition,2005. 3. Pankaj Sharma, "Web Technology", Sk Kataria & Sons, 5th Edition, Reprint 2024. **Reference Books:** 1. Laura Lemay ,"MASTERING HTML, CSS & Java Script", BPB Publication,1st Edition ,2016. 2. Prem Kumar "Web Design With HTML & CSS", Notion Press,1st Edition ,2021.

Course Code BCA-103	**Course Name:** Mathematical Fundamentals
Course Credit: 4.0	
Total No. of lectures allocates: 40	
Time: 3 Lecture hours +1 Tutorial per week	

Course Objectives	• Define the concepts and operations of matrix algebra. • Understand the concepts of probability, Bayes' theorem and independence problems. • Illustrate the basic concepts of sets, relations and functions. • Differentiate between Differentiation and Integration. • Evaluate the understanding of the concepts by applying them in different domains.
Learning Outcomes	• Evaluate and analyse the problem using sets and relations.. • Define the concepts and operations of matrix algebra. • Understand the basic concepts of probability and theorems. • Demonstrate and apply the concepts of differentiation and integration.

Unit	Contents	Lectures
I	**Sets, Relation & Functions** Definition of Set, Type of Sets, Operations on Sets, Venn diagram, Cartesian Product, Relations, Functions, Types of function, Some elementary functions with their graphs (Exponential, logarithmic, modulus). Limit & continuity of a function (Simple Problems).	8
II	**Matrices** Matrices, Types of Matrices, Operations of addition, Scalar Multiplication and Multiplication of Matrices, Determinant of a Square Matrix, Minors and Cofactors. Transpose, adjoint and inverse of a matrix. Solving system of linear equations in two or three variables using inverse of a matrix.	8
III	**Permutation, Combination and Probability** Permutation and Combination: Fundamental Principles of Counting, Addition Principle, Factorial, Permutations, Combinations. Probability: Definition of probability, laws of probability, Conditional probability, Independence of events, Bayes Theorem.	8
IV	**Differentiation** Derivative and its meaning, Differentiation of algebraic, trigonometric, exponential & logarithmic functions, Rules of Differentiation, Differentiation by substitution, Second order differentiation, Maxima and Minima of simple functions.	8
V	**Integration** Indefinite Integrals, Rules of Integration, Integration by substitution, Integration by Partial Fractions, Definite Integration, Properties of Definite Integral, finding areas of simple closed curves.	8

References:	**Text Books:** 1. Sanjay Mishra, " Fundamentals of Mathematics-Differential Calculus, 2023 2. S. C. Gupta & V. K. Kapoor, "Fundamental of Mathematical Statistics", Sultan Chand and Sons; 12th Edition, 2020. 3. Vivek Sinha, " Fundamental of Mathematics", Bluerose Publishers Pvt. Ltd., 1st Edition, 2022 **Reference Books:** 1. Joseph Edwards, "Differential Calculus for Beginners", Arihant Publication; 2nd Edition, 2023. 2. Sanjay Mishra, " Fundamentals of Mathematics-Integral Calculus, 1st Edition,2023. 3. R.D. Sharma, "Mathematics for class 12 part-1", Dhanpat Rai and Co. New Delhi., 2024. 4. R.D. Sharma, "Mathematics for class 12 Part-2", Dhanpat Rai and Co. New Delhi, 2024.

Course Code BCA-151	**Course Name:** Web Application Development Lab
Course Credit: 2.0	
Time: 4 hours per week	
Course Objectives	• To develop an ability to design and implement static and dynamic website • Choose best technologies for solving web client/server problems • Create conforming web pages • Use JavaScript for dynamic effects • Understand, analyze and create XML documents and XML Schema • Understand, analyze and build web applications using PHP • Use appropriate client-side or Server-side applications • Handling Cookies and Sessions using PHP, SERVLETS and JSP
Learning Outcomes	• Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's • Create web pages using HTML and Cascading Styles sheets • Analyze a web page and identify its elements and attributes • Create dynamic web pages using JavaScript • Understand, analyze and apply the role of languages like HTML, CSS, JavaScript in the workings of the web and web applications.
Contents	
HTML: Basics Elements & Attributes, HTML Formatting tags, Links, Images, Tables, Forms Elements, HTML5 Audio and Video, HTML5 Input Types & Attributes	
CSS : Syntax, CSS Attribute Selectors , CSS properties: Fonts, Background, Colors, Links, Lists, CSS Box Model, Display, CSS Layout, CSS Navigation Bar, CSS Rounded Corners, CSS Border Images, CSS Animations.	
Java Script: Displaying Output, Declaring Variables, Operators, Arithmetic, Data Types, Assignment , JavaScript Functions, Booleans, Comparisons, Conditional , JavaScript Switch, Loops, Break, Type, Strings and String Methods, Numbers and Number Methods, Math, JavaScript Dates: Formats and Methods, JavaScript Events, JavaScript, JavaScript Forms(Validation), JavaScript Functions.	
References:	**E-Resources** 1. Laura Lemay ,"MASTERING HTML, CSS & Java Script", BPB Publication,1st Edition ,2016. 2. Ivan Bayross,"Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI" ,BPB publication,4th Edition,2005. 3. WEB REFERENCES: ¬ a. NPTEL & MOOC courses titled Web Design and Development. b. https://www.udemy.com/topic/web-design/ c. W3Schoools .

Course Code BCA-152	**Course Name:** Computer Fundamentals & C Programming Lab
Course Credit: 2.0	
Time: 4 hours per week	
Course Objectives	• Implement programming concepts in C language • Experiment various functionalities through C programming. • Identify solution of given problem • Apply modular programming approach in designing solution • Evaluate & choose efficient solution • Construct small application like calculator etc. using C
Learning Outcomes	• Understand basic concepts of Computer and its organization. • Study essentials of computer's memory and Programming • Identify essential C programming concepts • Develop programs in C • Illustrate the applications of linear data structures like array, structures and Union in C

Contents

Simple C Programs to Learn
- Data types & Expressions, Constants & Variables
- Operators, Operator Precedence and associativity
- Keywords & Identifiers
- Storage Classes
- Conditional statements
- Looping Statements

Array and Modular Programming
- Basic Array programs using for loop
- User defined functions
- Recursion
- Programs on Two dimensional Arrays , Passing arrays as arguments

String handling
- Programs based on String Functions and Character Operation
- Programs based on an array of Pointers to Strings

Structure and Pointers
- Programs based on Structures & Unions
- Programs based on pointers (arithmetic operations on Pointer, arrays with pointers).

References:

E-Resources
1. Problem Solving through Programming in C, IIT Kharagpur Prof. Anupam Basu https://youtu.be/-wv-OERJK3M.
2. Programming and Data Structure by Dr.P.P. Chakraborty, Department of Computer Science and Engineering, IIT kharagpur. https://youtu.be/S47aSEqm_0I.

Course Code BCA-153	**Course Name:** Business English Communication Lab
Course Credit: 2.0	
Time: 4 hours per week	
Course Objectives	• To participate in an online learning environment successfully. • To distinguish among various levels of organizational communication and communication barriers while developing an understanding of Communication as a process in an organization • To stimulate their Critical thinking by designing and developing clean and lucid writing skills. • To demonstrate their verbal and non-verbal communication ability through presentations.
Learning Outcomes	• Learn Listening and Speaking Skills, Writing and Presentation Skills • Inculcates leadership & team skills and professional ethics. • Develop effective oral and written communication skills. • Apply various forms of technical communication.

Contents

Introduction to Means of Communication :
Meaning and Definition – Process – Functions – Objectives – Importance – Essentials of good communication – Communication barriers, 7C's of Communication.

Introduction to Types of Communication:
Oral Communication:Meaning, nature and scope – Principle of effective oral communication – Techniques of effective speech –Media of oral communication (Face-to-face conversation – Teleconferences – Press Conference –Demonstration – Radio Recording – Dictaphone – Meetings – Rumour – Demonstration and Dramatisation –Public address system – Grapevine – Group Discussion – Oral report – Closed circuit TV). The art of listening –Principles of good listening.

Introduction to Written Communication :
Purpose of writing, Clarity in Writing, Pricinciple of Effective writing, Writing Techniques, Electronic Writing Process.

Introduction to Business Letters & Reports:
Need and functions of business letters – Planning & layout of business letter – Kinds of business letters – Essentials of effective correspondence, Purpose, Kind and Objective of Reports, Writing Reports.

Introduction to Drafting of business letters:
Enquiries and replies – Placing and fulfilling orders – Complaints and follow-up Sales letters – Circular letters Application for employment and resume.

References:	**Text Books:** 1. K.K. Sinha,"Business Communication" Galgotia Publishing Company, 5th Edition,2021. 2. C.S. Rayudu,"Media and Communication Management",Himalaya Publishing House, 2nd Edition ,2011. 3. Rajendra Pal and J.S. Korlhalli,"Essentials of Business Communication", Sultan Chand & Sons,13th Edition,2011.
	References Books: 1. Lucas, Stephen E. The Art of Public Speaking. McGraw-Hill Book Co. International Edition, 11th Edition 2014. 2. Sharma, R.C. and Krishna Mohan," Business Correspondence and Report Writing", TMH.1st Edition 2016.

Course Code BCA-201	**Course Name: Computer Organization and Architecture**
Course Credit: 4.0	
Total No. of lectures allocated: 40	
Time: 3 Lecture hours + 1 Tutorial per week	
Course Objectives	• To have a thorough understanding of the basic structure and operation of a digital computer. • To study the different ways of communicating with I/O devices and standard I/O interfaces. • To learn the architecture and assembly language programming of 8085 microprocessor. • To study peripherals and their interfacing with 8085 microprocessor.
Learning Outcomes	• Understanding Logic gates, flip flops and Circuit • Understanding of Basic Computer Organization And Design • Understanding of Computer languages, translators and computer memories • Develop a base for advance micro-processors

Unit	Contents	Lectures
I	**Introduction of Number System Logic Gates :** Number system - Binary, decimal, octal, hexadecimal Conversion - Binary to decimal, decimal to binary, octal to decimal , decimal to octal, octal to binary, binary to octal, hexadecimal to binary, binary to hexadecimal, hexadecimal to Decimal, decimal to hexadecimal, hexadecimal to octal, octal to hexadecimal Binary arithmetic – Addition, subtraction (simple method) . Laws of Boolean Algebra., Logic gates like AND,OR.NAND and NOR,	8
II	**Introduction to Logic gates and circuit:** Logic gates - AND, OR, NOT, NAND, NOR, Exclusive-OR, Exclusive-NOR Combinational circuits - Half adder, Full adder, Data Processing circuit - Decoder, Encoder.	8
III	Introduction to Basic Computer Organization And Design: Instruction codes, Computer registers, Computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions , Input-output and interrupt, Design of Basic computer, Design of Accumulator Unit.	8
IV	**Introduction to Computer languages:** Introduction of Machine Language, Assembly Language and high level languages, uses of Assembler, interpreter and compiler,	8
V	Introduction to Memory Organization & Management : Classification of memory, Classification of memory By functionality (main, auxiliary, cache, associative, virtual), By access(random access, sequential access, semi random), By capability(RAM, ROM), Memory hierarchy.	8

References:	**Text Books:** 1. V. Rajaraman," Fundamentals of computers". PHI Publication.6th Edition ,2014. 2. J.L. Hennessy and D.A. Patterson," Computer Architecture: A Quantitative Approach", Morgan Kauffmann Publishers ,5th edition,2011. 3. M. Morris Mano, "Computer System Architecture", Pearson Publication,3rd Edition,2013. **Reference Books:** 1. K M Hebbar, "Computer Architecture", MacMillan Publication,1st Edition,2008 2. Jon Stokes," An Illustrated Introduction to Microprocessors and Computer Architecture ,No Starch Press,1st edition,2006. 3. B Govindrajalu, "Computer architecture and organization",Tata Mcgraw Hill,1st Edition,2003. 4. William Stallings, " Organization And Architecture: Designing For Performance", Pearson Education ,10th Edition,2016.

Course Code BCA-202	**Course Name:** Database Management System
Course Credit: 4.0	
Total No. of lectures allocates: 40	
Time: 3 Lecture hours +1 Tutorial per week	
Course Objectives	• Describe how data is stored, retrieved, and communicate in DBMS. • Design a logical model of relationship between data. • Understand query language for the databases. • Apply query language for management of data.
Learning Outcomes	• Describe various data models and schemas used in database management systems. • Explain the fundamental concepts, data definitions and query processing tasks in relational query languages. • Evaluate functional dependencies and normal forms in databases. • Illustrate several techniques related to transaction management and recovery.

Unit	Contents	Lectures
I	**Database System Concepts & Architecture** Overview of DBMS, Database System Applications, Database Systems versus File Systems, View of Data, Database Languages, Relational Databases, Database Design, Data Storage and Querying, Database Architecture, History of Database Systems.	8
II	**Data Modeling** Entity-Relationship Model: Introduction to Data base design and Basic concepts, ER diagrams, Entities-Weak & Strong Entities, Attributes and its types, Relationships and Relationship sets, Weak Entity Sets, Conceptual Design and ER diagram.	8
III	**Relational Model & Database Design** Introduction, CODD Rules, DBMS Terms- Relation, Tuple, Attribute, Cardinality, Degree of Relationship Set, Domain Database Schema, Schema Diagrams, Integrity constraints, Keys - Super Key, Candidate key, Primary Key, Foreign Key. Relational-Database Design: Introduction to Normalization: First three normal forms (1NF, 2NF, 3NF).	8
IV	**Transaction Management** Transactions: Concepts, ACID Properties, States of Transaction, Serializability, Isolation, Checkpoints, Deadlock Handling, Recovery & Atomicity, Log based recovery, Recovery with concurrent transactions.	8
V	**Introduction to SQL**: SQL Data Definition, SQL Data Types, Types of SQL, Create Table, Describe Command, Changing data with DML commands (Insert / Update Delete), SQL Operators, Group by with having, Order By, Distinct Keyword, Column Alias, Searching for NULL, Aggregate Functions.	8

References:	**Text Books:** 1. Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database Systems Concepts", 7th Edition, McGraw Hill, 2021. 2. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", 3rd Edition, McGraw Hill 2014. 3. Ivan Bayross,"SQL /PLSQL The Programming Language",BPB Publication,4th Edition ,2020. **Reference Books:** 1. R. Elmarsi and S.B. Navathe, "Fundamentals of Database Systems", Addison Wesley, 7th Ed., 2017. 2. James R. Groff & Paul N. Weinberg, "The Complete Reference SQL", McGraw Hill Education, 3rd Edition, 2017 3. Bipin Desai, "An Introduction to Database Systems", Galgotia Publications, 3rd Edition,2015. 4. S K Singh," Database Systems - Concepts, Design & Applications",Pearson Edition,2 Edition,2011

Course Code BCA-203	**Course Name: Operating System**
Course Credit: 4.0	
Total No. of lectures allocated: 40	
Time: 3 Lecture hours + 1 Tutorial per week	
Course Objectives	• To prepare student to make computer system convenient to use in an efficient manner. To hide the details of the hardware from the users. • To provide users a convenient interface to use the efficient and fair sharing of resources among users and programs
Learning Outcomes	• Describe how operating systems have evolved over tirne. • Understand various process management concepts and can compare various scheduling techniques, synchronization, and deadlocks. • Describe the concepts of memory management techniques. Identify the best suited process management technique for any process. • Describe various file operations, fi1e allocation methods and disk space management. To understand and identify potential threats to operating systems and the security featrires to guard against them. Leam to operate the Linux system,

Unit	Contents	Lectures
I	**Introduction of Operating System** : History and Evolution of OS, Basic OS functions, Types of operating Systems- Batch Systems, Multiprogramming Systems, Multiprocessing System, Time Sharing Systems, Distributed OS, Real time systems.. Applications of various operating system in real world. Some operating systems - windows,Linux, Android, MacOS, Blackberry OS, Symbian etc	8
II	**Introduction to** Process Management: Block. Process Scheduling: (Preemptive & NonProcess Concepts, Process states & Process Control Scheduling Criteria, Scheduling Algorithms Preemptive) - FCFS, SJF, SRTN, RR, Priority, Deadlock - Defi nition, Deadlock Charactetization, Necessary Conditions for Deadlock. Deadlock Handling Approaches: Prevention, Avoidance, Recovcry.	8
III	Introduction to Memory Management: Introduction, Address Binding, Logical versus physicai Address Space, Swapping, Contiguous & Non-Contiguous Aliocation, Fragmentation (Intemal & External), Compaction, Paging, Segmentatiorr, Vittoul Memory, Demand Paging, File Management: Concept of File System(File Attributes, Operations, Types), Functions of File System, Types of File System, Access Methods (dequential, Direct & other methods),	8
IV	**Introduction to Linux:** features of Linux, advantages, hardware requirements for installation, Linux architecture, file system of Linux - boot block, super block, inode table, data blocks. Linux standard directories, Linux kemel, Partitioning the hard drive for Linux, installing the Linux System, system - startup and shut-down ,Process, Swap, Partition, fdisk, checking disk free spaces. Difference between CLI OS & GUI OS, Windows v/s Linux, Importance of Linux Kernel, Files and Directory	8
V	Introduction to Indian contribution to the field - the BOSS operating system, open source softwares, growth of LINUX, Aryabhatt Linux, contributions of innovators - RaienSheth, Sunder Pichai etc	8

References:	**Text Books:** 1. A Silberschatz, P.B. Galvin, G. Gagne, "Operating Systems Concepts", 5th Edition,2001. 2. A.S. Tanenbaum, "Modern Operating Systems", Pearson Education' 3rd Edition, 2006. 3. Sumitabh Das," UNIX Concepts and Applications",4th Edition,2018. **Reference Books:** 1. Stalling, Operating Systems: A Modem Perspective, Pearson Education, 7th Edition, 2011. 2. Milenkovic,"Operating Systems, Intemals & Design Principles", Pearson Education 5th Edition,2013. 3. Dhananjay Dhamdhere, "Operating Systems: A Concepts", Tata McGraw Hill.3rd Edition 2017.

Course Code BCA-251	**Course Name:** DBMS Lab
Course Credit: 2.0	
Time: 4 hours per week	
Course Objectives	• Use Relational Algebra concepts in real world. • Describe and Implement SQL to extract data from tables.
Learning Outcomes	• Design the structure of database and tables • Create Entity Relationship Diagrams for modelling logical schema. • Implement the basic relational algebra concepts. • Create and manipulate data through SQL.

Contents

1. Analyze the organization and identify the entities, attributes and relationship in it.
2. Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.
3. Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities.
4. Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in tabular fashion.
5. Apply the Normalization Levels on the database designed on the organization.
6. SQL data types, Operators, Literals, Constraints
7. DDL Commands: Create Tables/Create Synonym /Create index /Views / Alter/Drop/Truncate/Comment/Rename/DBCC (Database Console Commands)
8. DML Commands: Insert / Update / Delete / Merge/Lock Table
9. DCL Commands: Grant / Revoke/Deny
10. Simple Queries: Select / From / Where
11. Group By/Having Clause
12. Order By clause
13. SQL Operators: Arithmetic / Logical /In / Like / Between
14. Functions: Aggregate / Numeric / String / Date & Time / Logical

References:

1. Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database Systems Concepts", McGraw Hill, 7th Edition, 2021.
2. Satyam Tyagi, " SQL For Beginners to Advanced : Volume II", Notion Press,1st Edition, 2022.
3. Nilesh D. Shah, "Database Systems Using Oracle: A Simplified Guide to SQL and PL/SQL" Pearson ,1st Edition,2001.

Course Code BCA-252	**Course Name:** Linux Programming Lab
Course Credit: 2.0	
Time: 4 hours per week	
Course Objectives	• To familiarize basic concept of Linux Operating system • To familiarize about basic commands and linux utilities • To demonstrate text editors and use of commands
Learning Outcomes	• Understanding about Linux operating System • Understanding about Linux file system and shell commands • Understanding and uses of the vi editors in detail.

Contents

The Linux Operating System - This section presents an overview of various types of software. It introduces you to the operating system software. The distinguishing features of single-user and multi-user operating system are explained. The section the covers the history of Linux and compares the Linux operating system with other operating systems available in the market. Various distributions of Linux are also mentioned in the section, with additional pointers to Wed Sites where you can obtain more information regarding various distributions.

Linux Basic - This section explains how you can log in and log out from a Linux session. It covers detailed explanation about the filesystem in Linux, the types of files, the types of users, and the file and directory management commands with examples. Section

Text Editors - This section presents introduction of the functions of an editor and compares the features of various editors. It covers the vi editors in detail.

Pipes and Filters - This section presents one of the most important concepts for working in Linux – pipes and filters. It covers the concept of standard files in Linux and also explains redirection. It explains the need for filters and pipes.

More Linux Utilities This section describes the various utilities available in Linux for enabling an end user to work efficiently on the system. It provides an overview of the utilities available for composing, sending, and receiving e- mails, scheduling routine tasks, and compressing file. Introduction with GNOM

References:

1. Richard Petersen "Linux: The Complete Reference", McGraw Hill Education,6th Edition,2017.
2. Prof. Dayanand Ambawade, "Linux Lab Hands on Linux", Dreamtech Press,1st Edition,2009.
3. Attila Kovacs, "Linux for Beginners", Sabi Shepherd Ltd, 1st Edition,2019.

Course Code BCA-253	**Course Name:** Communication and Soft Skills Lab
Course Credit: 2.0	
Time: 4 hours per week	
Course Objectives	• Lead students to effective performances in communication • Build up interpersonal skills and social responsiveness • Inculcate leadership, team skills and professional ethics. • Improve the students communicative skills
Learning Outcomes	• Learn Listening and Speaking Skills, Writing and Presentation Skills • Inculcates leadership & team skills and professional ethics. • Efficiently participate in GD/PI • Develop effective oral and written communication skills. • Apply various forms of technical communication.

Contents

Verbal & Non-verbal Communication

Listening, Speaking, Reading and Writing. Verbal and Non-verbal Communication. Intra, inter-personal and group communication skills. Gestures, postures, Listening to Lectures, Discussions.

Writing Skills

Formal & Informal writings, report writing, creative writing. Composition, Resume Writing, Cover letters, Business Letter Writing, Persuasive Letters, Job Applications and Official Correspondence, E-Mail etiquette, Precise writing.

Presentation Skills

Elements of effective presentation, structure of presentation, external factors and content.Debates, Seminar, Speeches, Lectures, Interviews, Mock Interviews.

Group Discussion

Structure of GD, Moderator led and other GDs, Strategies in GD, Team work body language, Mock GD, Problem solving.

Career Skills

SWOT Analysis, IQ, EQ and SQ, Decision making, Time Management, Team Management and Leadership Skills, 8 habits of successful people.

References:

1. Butterfield, Jeff, "Soft Skills for Everyone",Cengage Learning. 2nd Edition,2011.
2. Chauhan, G.S. and Sangeeta Sharma,"Soft Skills",Wiley. 1st Edition,2015.
3. Lucas, Stephen E, "The Art of Public Speaking",McGraw-Hill, 11th Ed. 2014.
4. Sharma, R.C. and Krishna Mohan, "Business Correspondence and Report Writing", TMH. 1st Edition ,2016.