DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY
Chhatrapati Sambhajinagar.

NAAC- 'A+' Grade

CIRCULAR /SU/CM/Revised Syllabus/NEP/88/2025

It is hereby inform to all concerned that, on the recommendation of the Dean, Faculty of Commerce & Management; **the Academic Council at its meeting held on 09th May, 2025 has been accepted the following *"Revised Subjeet/Degree Wise Syllabus of Under Graduate Level as per the National* Education Policy-2020** under the Faculty of Commerce & Management run at all Affiliated Colleges, Dr. Babasaheb Ambedkar Marathwada University.

Sr.No.	Courses	Semester
1.	B.Com	IIIrd & IV
2.	B.Com (E-Commerce)	IIIrd & IV
3.	B.B.A	IIIrd & IV
4.	B.C.A	IIIrd & IV
5.	B.C.M	IIIrd & IV

This is effective from the Academic Year 2025-26 and Onwards as per appended herewith.

All concerned are requested to note the contents of this circular and bring notice to the students, teachers and staff for their information and necessary action.

University Campus,
Chhatrapati Sambhajinagar
-431 004.
REF.NO. SU/COM/2025-26/1191-93
Date:- 05/ 07 /2025.

Deputy Registrar,
Syllabus Section.

Copy forwarded with to Information and Necessary Action:-

1] The Head, concerned Department,
2] The Director, Board of Examination & Evaluation,
3] The Director, University Network & Information Centre, UNIC, with a **request to upload this Circular on University Website.**
Dr.Babasaheb Ambedkar Marathwada University **Chhatrapati Sambhajinagar.**

Dr. Babasaheb Ambedkar Marathwada University,
Chhatrapati Sambhajinagar

Faculty of Commerce & Management

Bachelor of Computer Applications (Honours)

BCA Program Structure & Syllabus

As per NEP-2020

Dr. Babasaheb Ambedkar Marathwada University,
Chhatrapati Sambhajinagar

2025-26

(Semester III & IV)

Semester-III

Major DSC-5

Subject Title		**Database Management System**		
Subject Ref. No.		**BCA 301T**	**No. of Credits**	2
			No. of Periods / Week	2
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

1)	Understand and Describe basic concepts of Database Systems
2)	Understand concept of transaction and its importance in DBMS
3)	Map concepts of transactions, deadlock and locking techniques with examples
4)	Create tables and use them to store data efficiently.
5)	Execute commands to retrieve data with and without conditions.

Pre Requisite	NA
Unit – I	**Introduction** - Data, Tables, DBMS, Characteristics of DBMS, need of DBMS, attributes, entity, E-R Diagrams, relationships, ODBMS, Two tier and three tier architecture, Client, Server
Unit – II	**Transactions** -Concept of transaction, ACID properties, Transaction and system concepts, States of transaction, Serializibility, backup and recovery.
Unit – III	**Concurrency** - Concurrent transactions, Two –phase locking techniques, Concurrency control, Locking techniques, E-R Diagram, Deadlock
Unit – IV	Tables – Create table command, altering structure of a table, entering data, primary key and foreign key
Unit – V	Accessing data stored in DBMS, queries , store, access and retrieve data, Introduction to RDBMS concepts
	Total Lectures
Text Books	1. Elmasri, R., &Navathe, S. B. (2015). *Fundamentals of Database Systems*. Pearson. 2. Silberschatz, A., Korth, H. F., &Sudarshan, S. (2019). *Database System Concepts*. McGraw-Hill Education.
Additional Reference Books	1. Ullman, J. D., &Widom, J. (2008). *A First Course in Database Systems*. Pearson. 2. Date, C. J. (2003). *An Introduction to Database Systems*. Addison-Wesley. 3. Connolly, T., &Begg, C. (2014). *Database Systems: A Practical Approach to Design, Implementation, and Management*. Pearson.

Major DSC-6

Subject Title		OOPS Using C++		
Subject Ref. No.		BCA302T	No. of Credits	02
			No. of Periods / Week	30 /2
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

At the end of the course, students will be able to:

1	Understanding of Object oriented programming concepts.
2	To make students equip with the skills to design and implement modular, reusable and maintainable software using C++
3	Enhance problem solving and logical thinking abilities through practical application of OOPS principals.
4	Introduce advanced features of C++ such as operator overloading, file handling and exception handling.

Course Outcomes (COs)

At the end of the course, students will be able to:

CO-1	Students will understand and apply object oriented programming concepts like classes, objects, inheritance and polymorphism.
CO-2	Student will learn to develop modular and reusable programs using C++
CO-3	Implement file handling, templates, and exception handling in C++
CO-4	Students will be able to solve real world problems using OOP principles effectively.

Pre Requisite		There is no prerequisites for attending this course	No of Lecture
Unit – I		**Introduction To Object Oriented Programming** Overview of structured programming approach, Object oriented programming approach, Characteristics of object oriented languages **Basics of C++ programming** C++ Program Structure, Character Set and Tokens, Data Type, Type Conversion, Preprocessor Directives, Namespace, Input/Output Streams and Manipulators, Dynamic Memory Allocation with new and delete, Control Statements. Functions: Function Overloading, Inline Functions, Default Argument, Pass by Reference, Return by Reference, Scope and Storage Class. Pointers: Pointer variables declaration & initialization, Operators in pointers, Pointers and Arrays, Pointer and Function.	10

Unit – II		**Classes & Objects** A Simple Class and Object, Accessing members of class, Initialization of class objects: (Constructor, Destructor), Default Constructor, Parameterized Constructor, Copy Constructor, The Default Copy Constructor, Objects as Function Arguments, Returning Objects from Functions, Structures and Classes, Memory allocation for Objects, Static members, Member functions defined outside the class.	**10**
Unit – III		**Inheritance:** Type of inheritance single, multiple, multilevel, hierarchical & hybrid. Access specifiers Constructors and destructors in inheritance. **Operator Overloading** Fundamental of operator overloading, Restriction on operator overloading, Operator functions as a class members, Overloading unary and binary operator, Data Conversion (basic to basic, basic to user-defined, user-defined to basic, user-defined to user-defined) .	**10**
Text Books		1.Programming in C++, Ashok N Kamthane, Pearson 2nd Edition. 2.Programming in C, Reema Thareja, OXFORD 3.Object-Oriented Programming C++, Joyce Farrell, Cengage. 4.C Programming, a Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE	
Additional Reference Books		Let Us C++ by Yashvant Kanetkar Object-Oriented Programming with C++ by E. Balagurusamy	

Major DSC-7

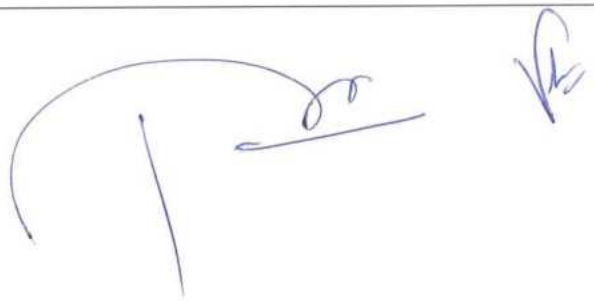
Subject Title		**Database Management System- Lab**			
Subject Ref. No.		**BCA 303P**	**No. of Credits**		2
			No. of Periods / Week		60/4
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

1)	Design Entity-Relationship (E-R) diagrams and map them to relational schemas for real-world applications. *(Related to Unit I & III)*
2)	Implement and manage database structures using SQL commands for creating, altering, and modifying tables. *(Related to Unit IV)*
3)	Perform data manipulation and retrieval using SQL queries, aggregate functions, joins, and subqueries. *(Related to Unit V)*
4)	Demonstrate the concepts of transactions, concurrency control, and recovery using SQL with support for ACID properties. *(Related to Unit II & III)*

Pre Requisite	NA
Unit – I	**Introduction to DBMS Concepts & E-R Diagrams** • **P1:** Study of basic DBMS commands and environment (using MySQL / Oracle / PostgreSQL) • **P2:** Design E-R diagrams using a case study (e.g., Library System, Student Information System) • **P3:** Mapping E-R diagram to relational schema
Unit – II	**Transactions and ACID Properties** • **P4:** Demonstrate basic transactions using BEGIN, COMMIT, and ROLLBACK • **P5:** Create a scenario to show ACID properties using DML operations
Unit – III	**Concurrency Control and Locking** • **P6:** Simulate two concurrent transactions and explore locking behavior • **P7:** Demonstration of deadlock scenario and prevention using simple SQL cases • **P8:** Draw E-R diagrams with multiple relationships (complex schema)
Unit – IV	**Working with Tables**

	• **P9:** Create and modify tables using CREATE, ALTER, and DROP • **P10:** Apply constraints: PRIMARY KEY, FOREIGN KEY, NOT NULL, UNIQUE • **P11:** Insert, update, and delete records using INSERT, UPDATE, DELETE
Unit – V	**Data Retrieval & RDBMS Operations** • **P12:** Retrieve data using SELECT, WHERE, ORDER BY, GROUP BY, HAVING • **P13:** Use of aggregate functions: COUNT, SUM, AVG, MAX, MIN • **P14:** Perform joins: INNER, LEFT, RIGHT, FULL OUTER JOIN • **P15:** Sub-queries and set operations: UNION, INTERSECT, MINUS
	Total Lectures
Text Books	3. Elmasri, R., &Navathe, S. B. (2015). *Fundamentals of Database Systems*. Pearson. 4. Silberschatz, A., Korth, H. F., &Sudarshan, S. (2019). *Database System Concepts*. McGraw-Hill Education.
Additional Reference Books	4. Ullman, J. D., &Widom, J. (2008). *A First Course in Database Systems*. Pearson. 5. Date, C. J. (2003). *An Introduction to Database Systems*. Addison-Wesley. 6. Connolly, T., &Begg, C. (2014). *Database Systems: A Practical Approach to Design, Implementation, and Management*. Pearson.

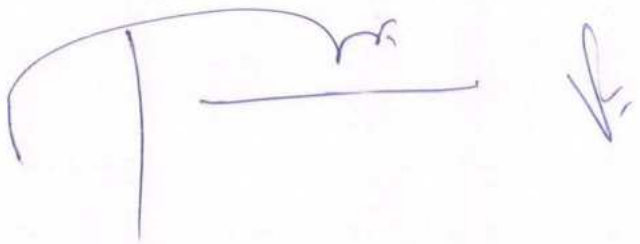


Major DSC-8

Subject Title		Practical Based on OOPS Using C++			
Subject Ref. No.		BCA304P	No. of Credits		02
			No. of Periods / Week		60 /4
			Assignments / Sessional		20
			Semester Examination		30

List of Experiments:

1. Write a Program that illustrates the simple C++ Concepts without classes.
2. Write a C++ Program to illustrate the concepts pointers, functions and function overloading.
3. Write a C++ program to illustrate the concept t: classes, friend function.
4. Write a C++ program to illustrate the concept: constructors, constructor overloading and destructors.
5. Write a C++ program to illustrate the concept: operator overloading (both Unary and Binary)
6. Write a C++ program to illustrate the concept: simple, multiple, multilevel inheritance.
7. Write a C++ program to illustrate the concept: polymorphism (virtual functions, Pure virtual functions).
8. Write a C++ program to illustrate file handling in C++.
9. Write a C++ program to illustrate templates in C++
10. Write a C++ program to illustrate exceptions in C++.
11. Write a program in C++ to check whether input word is palindrome or not.
12. Write a program to count vowels and consonants in a string.



Minor (Choose any one from each pool of course) It is different of the same faculty

MN-1

Subject Title		**A] Entrepreneurship Development**			
Subject Ref. No.		**BCA305T**	**No. of Credits**		02
			No. of Periods / Week		30 /2
			Assignments / Sessional		20
			Semester Examination		30

Course Objective: To introduce students to the fundamentals of entrepreneurship

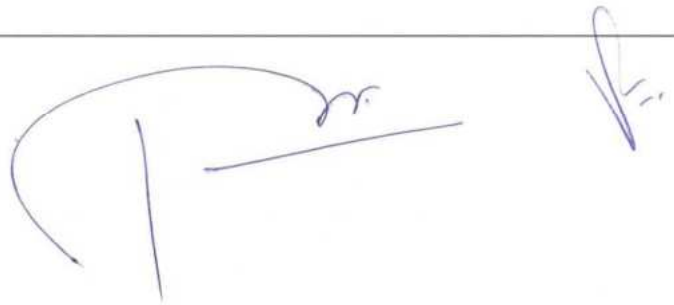
CO #	Cognitive Level (BTL)	Course Outcomes
CO1	Understanding	Understand the concept and significance of entrepreneurship.
CO2	Applying	Identify and apply tools for idea generation and business planning.
CO3	Evaluating	Evaluate the feasibility and sustainability of new business ideas.

Unit 1	**Foundations of Entrepreneurship Definition & Meaning of Entrepreneurship** • Types of Entrepreneurs: Innovative, Imitative, Fabian, Drone • Characteristics & Traits of an Entrepreneur • Importance in Economic Development: Job creation, Innovation, Wealth generation • Entrepreneurial Process: From idea to execution • Barriers & Challenges: Social, personal, and economic • Successful Entrepreneurial Stories (local/national)
Unit 2	**Opportunity Identification & Business Planning** • Sources of Business Ideas: Market gaps, Customer needs, Technological change • Creativity in Entrepreneurship: Lateral thinking, Mind mapping, Brainstorming • Idea Generation & Screening: SCAMPER, SWOT analysis • Opportunity Recognition and Feasibility Analysis (brief intro to technical, market, financial) • Business Plan Basics: Purpose and components (idea, market, operations, finance) • Legal Structures of Startups: Sole Proprietor, Partnership, LLP, Pvt Ltd • Startup Essentials: Registration, Licenses, Compliance overview • Sources of Funding: Bootstrapping, Angel, VC, Crowdfunding (intro only
Unit 3	**Social, Ethical & Sustainable Entrepreneurship** • Social Entrepreneurship: Concepts, Need, Examples • Corporate Social Responsibility (CSR) and Role of Entrepreneurs in Social Change • Ethics in Business: Ethical decision-making, Stakeholder interests • Sustainable Entrepreneurship: Green practices, Waste reduction, Triple Bottom Line

	• Basic Legal Awareness: IPR, Contracts (awareness level)

Recommended Readings

1. **Donald F. Kuratko – *Entrepreneurship: Theory, Process and Practice* 2. Peter F. Drucker – *Innovation and Entrepreneurship***
2. **Eric Ries – *The Lean Startup* 4.David Bornstein & Susan Davis – *Social Entrepreneurship: What Everyone Needs to Know***



Major (Core)Minor (MN-1)				
SubjectTitle	**A] MIS & DSS**			
SubjectRef.No.	**BCA305T**			
		No.ofCredits	:	2
		No. of Periods / week	:	2
		Assignments/Sessional	:	20
		SemesterExamination	:	30

CourseOutcomes(COs)

CourseObjective	Objectives include understanding MIS concepts, DSS principles, and their application in various business functions.
	1. Understand the fundamental concepts, definitions, characteristics, and objectives of Management Information Systems (MIS) and their role in enhancing organizational effectiveness. 2. Analyze the decision-making process within organizations and the impact of MIS in supporting managerial decision-making and control systems. 3. Examine IT infrastructure, data collection methods, and the classification of information, with a focus on contemporary platforms and their organizational impact. 4. Explore the concepts, components, and limitations of Decision Support Systems (DSS), Group Decision Support Systems (GDSS), AI, KMS and their integration with MIS for improved business processes.
Prerequisites	Basic knowledge of Computer Applications
UnitI	**MIS, Decision Making: An overview :** Concept, definition , characteristics, objectives , Role and impact of MIS, Management as a control system
UnitII	**Information, Knowledge, Business Intelligence :** Information: A quality product, Classification of information, methods of data and information collection, value of information, IT infrastructure, components, Planning, contemporary platforms, IT Capabilities and their organizational impact – Telecommunication, Networks & internet, current trends in technologies & tools — IT enabled services, e business, wireless technologies etc. **System Engineering: Analysis and design, BPR** System: concept and control, types of system, general model of MIS, need of system Analysis, SDM, SSAD, OOA, OOSAD Development Life cycle, development process of MIS, Strategic design of MIS, Business process, Process model of an organization, MIS and BPR
UnitIII	**DSS, ESS, OAS : Overview of SDD, ESS & OAS. Components of DSS, ESS & OAS** **Knowledge system , artificial intelligence and ERP :** Knowledge system, types of knowledge system, Expert system, application of ES, benefits and Limitations of ES, knowledge base, inference engine, AI, neural network in business, SIS, EMS, ERP, ERP models and modules, benefits of ERP, ERP implementation, SCM, CRM.
TextBook	
ReferenceBooks	

Minor (MN-2)			
Subject Name	**B] Functional Management**		
Subject Ref. No.	**BCA306T**	**No. of Credits**	**2**
		No. of Periods / Week	**2**
		Assignments / Sessional	**20**
		Semester Examination	**30**

Course Objectives: To equip students with foundational knowledge of core functional areas of business: Marketing, Finance, Human Resources, and Operations.

CO #	Cognitive Level (BTL)	Course Outcomes
CO1	Understand	Explain the concept and role of functional management and its major domains..
CO2	Apply	Apply basic concepts of Marketing, Finance, and HR to simple business scenarios..
CO3	Analyze	Analyze the interdependence between various business functions & decision-making processes.

Unit	Contents	Duration
1	**Introduction to Functional Management & Overview of Business Functions** • Definition, Scope, and Nature of Functional Management • Principles and Importance of Specialization in Management • Overview of Major Business Functions: ○ Marketing, Finance, Operations, Human Resource & Information Technology (brief intro) • Interrelationship of Functional Areas and Coordination • Role of Functional Heads and Departmental Objectives	**10 Hours**
2	**A. Marketing Management** • Definition and Importance of Marketing • The 4Ps: Product, Price, Place, Promotion • Role of Market Research and Consumer Behavior • Marketing Channels and Digital Marketing Basics **B. Financial Management** • Meaning and Objectives of Financial Management • Functions: Budgeting, Accounting, Investment Decisions • Basic Concepts: Revenue, Cost, Profit, Break-even • Introduction to Financial Statements	**10 Hours**
3	**A. Human Resource Management** • Role and Functions of HR • Key HR Activities: Recruitment, Selection, Training, Appraisal • Employee Motivation and Welfare • Introduction to HR Technology (HRIS) **B. Operations Management** • Introduction to Production and Operations • Product vs. Service Operations • Quality Control, Inventory Basics • Importance of Supply Chain and Logistics	**10 Hours**

Suggested Readings-

1. Nigam Priti V.- Functional Management, Himalaya Publishing House, Mumbai
2. M.J. Mathew- Functional Management, RBSA Publishers, Jaipur.
3. Beach Dale S.- Personnel Management, Himalaya Publishing House, New Delhi.
4. Philip Kotler- Marketing Management, Prentice Hall, New Delhi.
5. Subba Rao P- Human Resource Management, Himalaya Publishing House, New Delhi

Minor (MN-2)					
Subject Title		**B] Mathematics (Numerical Methods)**			
Subject Ref. No.		**BCA306T**	**No. of Credits**		2
			No. of Periods / Week		30 /2
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

1)	To understand the importance of error analysis and their propagation.
2)	To introduce the basic concepts of solving algebraic, transcendental equation and system of non-linear equations.
3)	To understand techniques of interpolation and polynomial fitting.
4)	To understand methods of numerical differentiation, integration and solution of ordinary differential equations.

Course Outcomes (COs)

At the end of the course, students will be able to:

CO-1	Understand the basic concept of root finding methods, system of equations and their solutions.
CO-2	Understand the concepts of interpolation and constructions of polynomials.
CO-3	Application of numerical methods to understand the concept of differentiation and integration.
CO-4	Solve differential equations numerically.

Pre-Requisite		Basic knowledge of Mathematics and Algebra	**Number of Lecture**
Unit – I		Numbers and their accuracy. Errors and their computations -Absolute, Relative and percentage. Solution of Non-linear and transcendental equations Bisection method, method of False position and Newton-Raphson method. Solution of linear simultaneous equations. Gauss-Elimination method, Gauss-Jordan method and Gauss-Seidal iterative method.	7
Unit – II		Interpolation. Lagrange's interpolation, Finite difference, Forward, Backward and Central, Newton's formulae for Forward, Backward and	8

		Central interpolation Regression Analysis, Linear regression, polynomial regression. Fitting an exponential curve and Hyperbolic regression	
Unit – III		Numerical diffcrentiation and integration, derivative using Newton's forward and backward difference formulae , Stirling formula ,Numerical integration-Trapezoidal rule, Simpson's 1/3rule ,Simpson's 3/8 rule ,Numerical solution of ordinary differential equations, solution by Taylor's series ,Euler's method, modified Euler's method ,Runge-Kutta method of 2^{nd} and 4^{th} order	**15**
Text Books		1. V. Rajaraman "Computer oriented numerical methods" (third edition)1993 2. S. S. Shastri "Introductory methods of numerical analysis" Vol-2 PHI, second edition	
Additional Reference Books		1. V .N. Vedamurthy "Numerical methods "Vikas Publishing House, . New Delhi2005 2. B.S.Grewal " Numerical methods in Engineering &Science, Khanna Publishers,Delhi2005	

GE/OE (Choose any one for other Faculty Students) GE/OE-03

GE/OE-03				
Subject Title :	**A] Advance Web Technology**			
Subject Ref. No.	**BCA307T**	No. of Credits	:	**02**
Assignments/Sessional	:			**20**
Semester Exam.	:			**30**

Course Outcomes (COs)

At the end of the course, students will be able to:

1. **CO1:** Explain the structure and syntax of HTML5, including semantic elements, lists, tables, and multimedia embedding.
2. **CO2:** Describe the principles of CSS styling, including selectors, the box model, and layout techniques (e.g., Flexbox).
3. **CO3:** Analyze the role of forms in web development, including input types, validation, and accessibility considerations.
4. **CO4:** Evaluate responsive web design techniques, including media queries, viewport settings, and fluid grid systems.

Prerequisite :	
Unit –I :	**HTML Fundamentals** 1.1 Introduction to Web Technologies • How websites work • Client-server architecture • Role of HTML in web development 1.2 HTML Basics • HTML document structure (<!DOCTYPE>, <html>, <head>, <body>) • Basic tags (<h1>-<h6>, <p>, , <hr>) • Text formatting tags (, , <mark>) 1.3 HTML Lists & Links • Ordered ( ), Unordered ( ), and Description (<dl>) lists • Creating hyperlinks (<a href="">) • Absolute vs. Relative URLs 1.4 HTML Media Elements • Embedding images (<img>) • Audio (<audio>) and Video (<video>) tags • Using iframes (<iframe>)
Unit –II :	**Advanced HTML & Forms** 2.1 HTML Tables • Creating tables (<table>, <tr>, <td>, <th>) • Table attributes (colspan, rowspan) • Table styling with CSS 2.2 HTML Forms • Form structure (<form>) • Input types (text, email, password, radio, checkbox, etc.) • Form attributes (action, method, name) 2.3 Semantic HTML • Semantic tags (<header>, <nav>, <section>, <article>, <footer>) • Benefits of semantic markup (SEO, accessibility) 2.4 HTML Meta Tags & SEO Basics

	• <meta> tags (charset, viewport, description) • Importance of title tags (<title>) • Basic SEO principles for HTML
Unit – III :	**CSS Styling & Layouts** 3.1 Introduction to CSS • Inline, Internal, and External CSS • CSS syntax (selectors, properties, values) • Basic styling (color, font, background) 3.2 CSS Box Model • Margin, Border, Padding, Content • Box-sizing property 3.3 CSS Layout Techniques • Display property (block, inline, inline-block) • Positioning (static, relative, absolute, fixed) • Flexbox basics 3.4 Responsive Web Design • Media queries (@media) • Viewport meta tag • Fluid grids and responsive units (%, vw, vh)
Reference Books :	"Head First HTML and CSS" – *Elisabeth Robson & Eric Freeman* HTML,DHTML,JavaScript,Perl&CGIIvanBayross HTML& CSS:TheCompletereference,FifthEditionByThomas Powell

Subject Title		B] Digital Electronics			
Subject Ref. No.		BCA307T (B)	No. of Credits		2
			No. of Periods / Week		30 /2
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

At the end of the course, students will be able to:

1	To provide the fundamental concepts associated with the digital logic and circuit desig
2	To introduce the basic concepts and laws involved in the Boolean algebra and families and digital circuits
3	To familiarize with the different number systems, logic gates, and combinational and sequential circuits utilized in the different digital circuits and systems.

Course Outcomes (COs)

At the end of the course, students will be able to:

CO-1	Examine the structure of number systems and perform the conversion among diff number systems
CO-2	Became familiar with the digital signal, positive and negative logic, Boolean algebra, gates, logical variables, the truth table,
CO-3	Illustrate reduction of logical expressions using Boolean algebra, k-map and tabul method and implement the functions using logic gates

Pre Requisite		There is no prerequisites for attending this course	No of Lecture
Unit – I		**Number Systems** Analogue versus Digital ,Number Systems , Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System, 1's Complement & 2's Complement subtraction, Conversion Binary - Decimal, Octal-Decimal, Hexadecimal-Decimal, Decimal-Binary, Decimal-Octal, Decimal-Hexadecimal, Binary - Octal, Octal - Binary, Hex - Binary, Binary - Hex, Hex - Octal and Octal - Hex. **Binary Codes & Digital Arithmetic** Binary Coded Decimal (BCD), , ASCII code, Basic Rules of Binary Addition	10

		and Subtraction, Binary Addition, Multiplication, Subtraction Using 1's & 2's Complement,	
Unit – II		**Logic Gates & Boolean Algebra** Positive and Negative, Truth Table, Logic Gates, OR Gate, AND Gate, NOT Gate, EX-OR Gate, NAND Gate, NOR Gate, EX-NOR Gate, Universal Gates. Introduction to Boolean Algebra, Postulates of Boolean Algebra, Theorems of Boolean Algebra,	**10**
		Simplification Techniques Sum-of-Products Boolean Expressions, Product-of-Sums Expressions, ∑and Pi Nomenclature, Karnaugh Map Method, Construction of a Karnaugh Map, K Map for 2, 3 & 4 variables, rolling & Overlapping, Don't care condition	
Unit – III		**Arithmetic Circuits** Combinational Circuits, Implementing Combinational Logic, Arithmetic Circuits Basic Building Blocks, Half-Adder, Full Adder,Half-Subtractor,Full Subtractor. **Flip-Flops** Flip-Flop, Clocked R-S Flip-Flop, J-K Flip-Flop, J-K Flip-Flop with PRESET and CLEAR Inputs, Toggle Flip-Flop, D Flip-Flop.	**10**
Text Books		1) Digital Electronics Principles, Devices and Applications By Anil K. Maini , John Wiley & Sons, Ltd 2) Digital Electronics & Micro- Computer R.K Gaur Dhanpat Rai Publication 3) Modern Digital Electronics By R.P Jain MC Graw Hill Publication	
Additional Reference Books		Digital Fundamentals by Thomas L. Floyd , Pearson Education Limited	

Vocational Skill Course (VSC) -03 A) Business Laws & B) Business Laws Lab				
Subject Ref. No.	**BCA308P**	**No. of Credits**		**2**
		No. of Periods / Week		**2**
		Assignments / Sessional		**20**
		Semester Examination		**30**

Course Objective: To equip students with practical skills in understanding, interpreting, and applying core business laws relevant to day-to-day business operations and entrepreneurial activities.

CO #	Cognitive Level (BTL)	Course Outcomes
CO1	**Understand**	Explain the basic structure of business laws and interpret key legal concepts.
CO2	**Apply**	Identify appropriate laws applicable to business scenarios and assess their implications.
CO3	**Analyze**	Analyze real-life cases to interpret compliance issues under various business laws
CO4	**Create**	Draft essential legal documents such as contracts, deeds, and notices..

Unit	Theory Component (1 hr/week)	Lab Component (2 hrs/week)
1	**Fundamentals of Business Laws** • *Introduction to the Indian Legal System.* • *Nature of Contracts: Essentials, Types (void, voidable, valid), Breach and Remedies.* • *Key Legal Terminologies (party, agreement, indemnity, etc.)*	**Document Drafting & Legal Literacy Lab** - Draft a simple service agreement - Clause identification in sample contracts - Legal term flashcard exercises & vocabulary quizzes
2	**Business Transaction Laws** • *Sale of Goods Act*: Formation of contract of sale, transfer of property, rights of buyer and seller. • *Consumer Protection Act*: Consumer rights, grievance redressal mechanism. • *Indian Partnership Act*: Essentials of a partnership, types, registration, duties and liabilities.	**Scenario & Case Lab** - Case study: Faulty goods under Sale of Goods Act - Draft a Consumer Complaint to District Forum - Role play: Formation and registration of a partnership firm
3	**Digital and Labour Laws for MSMEs** • *Information Technology Act*: Validity of electronic contracts, digital signatures – • *Shops and Establishments Act*: Applicability and key provisions • *Minimum Wages Act*: Compliance, authorities, penalties	**Compliance & E-Filing Lab** - Simulation of business registration using a government portal - Prepare checklist for labour law compliance - Navigate and explore MCA and GST e-filing portals

Suggested Practical Lab Assignments:

Week	Practical Output
1–2	Draft of a simple contract with identified clauses
3–4	Partnership deed (template) and a filled Consumer Complaint format
5–6	Simulated MCA business registration screenshot and compliance checklist
7–8	Group role play recordings / submissions (Buyer-Seller / Partner dispute)
9–10	Mock case study on e-contract fraud and possible legal action report
11–12	Business license registration checklist and demo walk-through of e-filing

Suggested Mini Project Topics (Lab Based)

- Drafting & presenting a business contract with legal clauses
- Simulating business registration process with checklist
- Case study on consumer protection with real judgment
- Role-play exercise on breach of contract & remedy

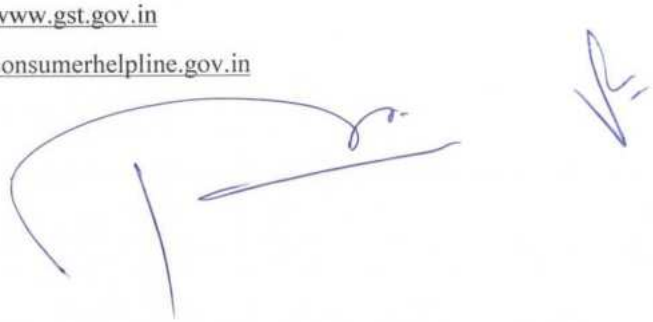
Resources

Textbooks

- Kapoor, N.D. – *Elements of Mercantile Law*
- Gulshan, S.S. – *Business Law*

Online Portals for Lab Work

- https://www.mca.gov.in
- https://www.gst.gov.in
- https://consumerhelpline.gov.in



Vocational Skill Course (VSC) -03				
A) Advance Web Technology & B)Advance Web Technology Lab				
Subject Title :	**A] Advance Web Technology**			
Subject Ref. No.	**BCA308P**	No. of Credits	:	**02**
Assignments/Sessional	:			**20**
Semester Exam.	:			**30**

Course Outcomes (COs)

At the end of the course, students will be able to:

5. **CO1:** Explain the structure and syntax of HTML5, including semantic elements, lists, tables, and multimedia embedding.
6. **CO2:** Describe the principles of CSS styling, including selectors, the box model, and layout techniques (e.g., Flexbox).
7. **CO3:** Analyze the role of forms in web development, including input types, validation, and accessibility considerations.
8. **CO4:** Evaluate responsive web design techniques, including media queries, viewport settings, and fluid grid systems.

Prerequisite :	
Unit –I :	HTML Fundamentals 1.1 Introduction to Web Technologies • How websites work • Client-server architecture • Role of HTML in web development 1.2 HTML Basics • HTML document structure (<!DOCTYPE>, <html>, <head>, <body>) • Basic tags (<h1>-<h6>, <p>, , <hr>) • Text formatting tags (, , <mark>) 1.3 HTML Lists & Links • Ordered ( ), Unordered ( ), and Description (<dl>) lists • Creating hyperlinks (<a href="">) • Absolute vs. Relative URLs 1.4 HTML Media Elements • Embedding images (<img>) • Audio (<audio>) and Video (<video>) tags • Using iframes (<iframe>)
Unit –II :	Advanced HTML & Forms 2.1 HTML Tables • Creating tables (<table>, <tr>, <td>, <th>) • Table attributes (colspan, rowspan) • Table styling with CSS 2.2 HTML Forms • Form structure (<form>) • Input types (text, email, password, radio, checkbox, etc.) • Form attributes (action, method, name)

	2.3 Semantic HTML • Semantic tags (<header>, <nav>, <section>, <article>, <footer>) • Benefits of semantic markup (SEO, accessibility) 2.4 HTML Meta Tags & SEO Basics • <meta> tags (charset, viewport, description) • Importance of title tags (<title>) • Basic SEO principles for HTML
Unit – III :	CSS Styling & Layouts
	3.1 Introduction to CSS • Inline, Internal, and External CSS • CSS syntax (selectors, properties, values) • Basic styling (color, font, background) 3.2 CSS Box Model • Margin, Border, Padding, Content • Box-sizing property 3.3 CSS Layout Techniques • Display property (block, inline, inline-block) • Positioning (static, relative, absolute, fixed) • Flexbox basics 3.4 Responsive Web Design • Media queries (@media) • Viewport meta tag • Fluid grids and responsive units (%, vw, vh)
Reference Books :	"Head First HTML and CSS" – Elisabeth Robson & Eric Freeman HTML, DHTML, JavaScript, Perl & CGI Ivan Bayross HTML & CSS : The Complete reference, Fifth Edition By Thomas Powell

Subject Title :	B] Advance Web Technology Lab

Course Outcomes (COs)

At the end of the course, students will be able to:

CO1: Construct valid HTML5 documents using semantic markup, lists, tables, and multimedia elements.

CO2: Develop interactive web forms with input validation and accessible design principles.

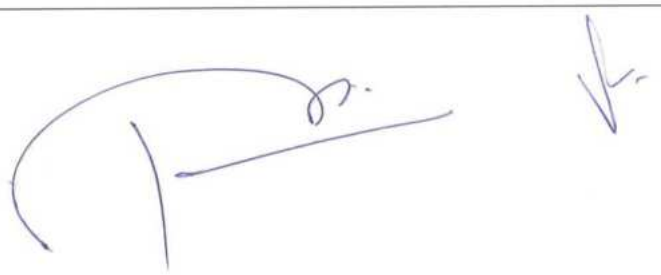
CO3: Apply CSS styling techniques to control layout, typography, and visual effects using the box model and selectors.

CO4: Implement responsive web designs using Flexbox and media queries for cross-device compatibility.

Prerequisite :	
Unit –I :	HTML Fundamentals Lab Objective: Build structured web pages using HTML5 Lab 1.1: Basic HTML Page o Create a valid HTML5 document o Add headings, paragraphs, line breaks, and horizontal rules o Submit as personal_profile.html Lab 1.2: Lists & Hyperlinks o Build a nested list (course curriculum) o Create a navigation menu linking to 3 sections o Add external links (e.g., university website) Lab 1.3: Media Integration o Embed images with alt text o Add a background video/audio player o Create a YouTube embed using iframe *Based on above objective any other exercises can be performed.
Unit –II :	Advanced HTML & Forms Lab Objective: Develop interactive web components Lab 2.1: HTML Tables o Design a semester grade report table o Use colspan/rowspan for merged cells o Add CSS for border styling Lab 2.2: Forms o Create a student registration form o Include: text fields, radio buttons, checkboxes, dropdown o Implement form validation (HTML5 attributes) Lab 2.3: Semantic Layout o Convert a newspaper article to semantic HTML o Use <article>, <section>, <aside>, <figure> *Based on above objective any other exercises can be performed.
Unit – III :	Chapter 3: CSS Styling & Layouts Lab Objective: Master styling and responsive design Lab 3.1: CSS Basics o Style Lab 1.1 with external CSS o Modify fonts, colors, and backgrounds o Add hover effects to links Lab 3.2: Box Model & Layout o Create a product card with margin/padding o Build a header-nav-content-footer layout o Experiment with display: flex Lab 3.3: Responsive Design o Make Lab 2.3 responsive with media queries o Test on mobile/desktop views o Use relative units (vw, %)

	Final Project:
	• Combine all concepts into a 3-page portfolio website
	• Requirements:
	  ○ Semantic HTML
	  ○ CSS styling + Flexbox
	Mobile-friendly design
	
	*Based on above objective any other exercises can be performed.

Reference Books :	"Head First HTML and CSS" – Elisabeth Robson & Eric Freeman HTML, DHTML, JavaScript, Perl & CGI Ivan Bayross HTML & CSS : The Complete reference, Fifth Edition By Thomas Powell



	AEC : Ability Enhancement Course (Choose any one – Modern Indian Languages)							
AEC3	BCA309T	English (Common for all faculty)	02 hrs / per week	02	50	30	20	20
	OJT/FP/CEP/RP							
FP1	BCA310P	Field Project	(04/per week)	02	50	30	20	20
CC3	BCA311P	Cultural Activity / NSS / NCC (Common for all faculty)	60 (04/per week)	02	50	30	20	20

Semester-IV

Major (Core) – DSC-9					
SubjectTitle		**Java Programming**			
SubjectRef.No.		**BCA401T**			
			No.ofCredits	:	2
			No. of Periods / week	:	30/2
			Assignments/Sessional	:	20
			SemesterExamination	:	30

CourseOutcomes(COs)

At theendofthecourse,students willbeableto:

CO-1	Write, compile, and execute Java programs that may include basic data types andcontrol flow constructs using J2SE or other Integrated Development Environments(IDEs) suchas Eclipse,NetBeans,andJDeveloper
CO-2	demonstratetheuseofgoodobject-orienteddesignprinciplesincludingencapsulation,informationhiding,Inheritance,FullAbstractionandPartialAbstraction
CO-3	CreateGUIApplicationusingApplet &HTML
CO-4	ImplementtheMultithreadingConceptwithrealtimeapplication

CourseObjective	ThissubjecthelpstoclarifytheprogrammingconceptsinJAVAlanguage.This language coversall thetechniquesofdeveloping the JAVAprograms. The coursestructure of JAVA programming Languages is helpto develop web based applicationsandAPPsforAndroidMobiles
Prerequisites	FundamentalsofComputerSystem,operatingsystem,CandC++Language
UnitI	Java Fundamentals , J2SE, J2EE, J2ME, Features of Java ,OOPs concepts, benefits ofJAVA, Hardware / Software requirement, Support system and Environment of JAVA,System Variable, Environment Variable, Path and Class Path. JAVA API. Application ofMore JAVA, application with two classes, program structure , tokens, statementsinstalling and configuration JAVA , implementing JAVA program, JAVA virtual M/CArchitecture and different alias with functionality, command line arguments, programstyle, keywords , data types, Operators, Decision MakingandBranching, loopingStatement.Predefinedclasses(Scanner,Date,Random…….)
UnitII	Class objects and methods: class definition, class types-Bean Class, POJO class, FactoryClass, Singleton Class, Runtime class, Inner Class. methods, fields declaration. Object,waystocreateanobjectandoperationsonit.GarbageCollector.constructor,overloading , static members , nesting methods , Inheritance, overloading , Final classandMethods,arraystringandvector,Interfaces:definition,implementation,accessing Interface Variables , Packages :introduction, uses , creating , accessingadding aclasstopackagehidingclass
UnitIII	MultithreadedProgramming:Introduction,creatingthreads , Applet Programming :Introduction ,preparing to write Applets building Applets code, creatinganexecutable Applet ,designing a web page , applet tag, adding Applet Tag, runningappletmoreHTMLtags,eventhandling. AWT programming, basic components of AWT. Listeners used in AWT. ManagingInput / Output Files in JAVA : streams, streams classes, Byte streamsclasses , reading and writing characters , bytes,Random Access Files ,
TextBook	ProgrammingwithJavaAPrimer,E.Balaguruswamy TataMcGrawHillCompanies,CoreJava,DietelandDietel

ReferenceBooks	ThecompletereferenceJAVA2,Herbertschildt.TMH,JavaProgrammingJohnP.FlyntThomson 2nd, Java Programming Language Ken Arnold Pearson , Big Java, CayHorstmann 2ndedition,WileyIndiaEdition

Major (Core) - DSC-10				
SubjectTitle		**Java Programming**		
SubjectRef.No.		**BCA402p**		
		No.ofCredits	:	2
		No. of Periods / week	:	60/ 04
		Assignments/Sessional	:	20
		SemesterExamination	:	30

CourseOutcomes(COs)

At theendofthecourse,students willbeableto:

CO-1	Write, compile, and execute Java programs that may include basic data types andcontrol flow constructs using J2SE or other Integrated Development Environments(IDEs) suchas Eclipse,NetBeans,andJDeveloper
CO-2	demonstratetheuseofgoodobject-orienteddesignprinciplesincludingencapsulation,informationhiding,Inheritance,FullAbstractionandPartialAbstraction
CO-3	CreateGUIApplicationusingApplet &HTML
CO-4	ImplementtheMultithreadingConceptwithrealtimeapplication

Course Objective	This subject helps to clarify the programming concepts in JAVA language. Thislanguage covers all the techniques of developing the JAVA programs. The coursestructureofJAVAprogrammingLanguagesishelptodevelopwebbasedapplicationsandAPPsfor AndroidMobiles
Prerequisites	FundamentalsofComputerSystem,operatingsystem,CandC++Language
1.	Practical demo on JDK installation, Path setting , Classpath Setting , Run programon Console,MyEclipse
2.	WAPatodemonstratetheprimitivedatatypeswiththeirdefault values.
3.	WAPatodemonstratetheLoopinganddecisionstatementsinJava.
4.	WAPatodemonstratethefunction ofPredefinedclass***Scanner***.
5.	WAPatodemonstratethefunctionofPredefined class***Date***.
6.	WAPatodemonstratethefunctionofPredefined class***Random***.
7.	WAPaprogramtodemonstratetheuseofStaticmemberandstaticmethod
8.	WAPaprogramtodemonstrate theuseofStaticmember,staticblockandstaticmethod
9.	WAPaprogramtodemonstratetheuseofthis,InstanccInitializerblock
10.	WAPaprogramtodemonstratetheapplicationofInheritanceusingIS-Arelation &Has-Arelation.

11.	WAPaprogramtodemonstratetheapplicationofconstructorsinInheritanceconceptusingIS-A relation&Has-A relation.
12.	WAPtodemonstratetheuseofsuperkeywordininheritance.
13. x	WAPtodemonstratetheuseoffinalkeywordwithinstancevariable,withmethodandwithclassname.
14.	WAPtodemonstratetheimplementationofanArray&VectorinJavaanditsaccess methodsusing enhancefora& Enumeration
15.	WAPtodemonstrateallAccessModifiersinJAVA.Default,public,private&protected.
16.	WAPthatdemonstratetheapplicationsofabstract classandinterfaceinJAVA
17.	WAPtodemonstratetheimplementationofMultiThreadingusingThread Class.
18.	WAPtodemonstratetheimplementationofMultiThreadingusingRunnableInterface.
19.	WAPtomanagetheArithmeticExceptioninJava.
20.	WAPtomanagetheNullPointerExceptioninJava.
21.	WAPtomanagetheNumberFormatExceptioninJava.
22.	WAPtomanagetheArrayIndexOutOfBoundsExceptioninJava.
23.	WAPtodemonstrateaSimpleAppletFunctionalityinJAVA.
24.	WAPtodemonstratevariousshapesavaiLabelinGraphicsclasswhichcanbeimplements inJAVAApplet.
25.	WAPtodemonstratetheApplet withFontSize,Font,Color.
26.	WAPtoconfigurethecomponentsinHTMLfileandfetchitinApplet&manipulate.
27.	WAPtoconfigurethenumberin HTMLfileandprintitstableinApplet.
28.	WAPtocreateRandomCirclesinAppletusingRandomClassandMultiThreading.
29.	WAPaprogramtoCreateaFramebyusing InheritanceandAssociation
30.	WAPtodemonstrateAll layouts used in AWT
31.	WAPaprogramtovalidateLoginPageusing TextField &Button
32.	WAPtocreateaCalculatorin awt
33.	WAPtocreateMenuBarusingMenuandMenuItemapplicationusingLabel.
34.	WAPtocreateMenuBarusingMenuandMenuItem applicationusingLabelandapplyActionListenerInterface
35.	WAPtodemonstratetheUseofDialogBox.
36.	WAPtoentertwonumbersinDialog BoxandperformAddition onit
37.	WAPtodemonstratetheUseof all ListeneronDifferent Components.
38.	WAPtowrite& readacharactertoFile.
39.	WAPtowrite& readastringtoFile.

Major (Core) - DSC-11& 12				
SubjectTitle	**Cost Accountancy**			
SubjectRef.No.	**BCA403T**	**No.ofCredits**	:	4
		No. of Periods / week	:	04/week
		Assignments/Sessional	:	40
		SemesterExamination	:	60

Course Objective: To equip students with the fundamental concepts, tools, and techniques of cost accountancy for effective cost control, analysis, and managerial decision-making.

CO #	Cognitive Level (BTL)	Course Outcomes
CO1	Understanding	Understand the nature and scope of cost accountancy..
CO2	Analyzing	Analyze the components and classification of costs..
CO3	Applying	Prepare cost sheets and apply cost concepts to solve basic numerical problems..
CO4	Evaluating	Evaluate material and wage control systems with appropriate methods.

Unit	Contents	Lectures
Unit 1	**Introduction** Cost, costing, cost accounting and cost accountancy, Financial accounting and its limitation, Difference between Financial and Cost accounting. Functions of cost accounting, Objectives of cost accounting, Advantages and Disadvantages of cost accounting,	12
Unit 2	**Elements of cost** Concept of cost, Cost object and its types, Cost Centre and its types, Cost unit-its types and measurement used as a unit, Elements of cost-Material Cost, Labor Cost, Overhead Cost	12
Unit 3	**Cost Sheet (Theory and Numerical)** Cost sheet, Purposes of cost sheet, Component of cost sheet-Prime cost, Factory or works cost or manufacturing cost, Cost of Production, Cost of Sales or Total Cost. Preparation of Cost Sheet (Simple practical problems)	12
Unit 4	**Material (Theory and Numerical)** Meaning of material, its classification and types, Material control, Objectives/advantages of material control, Bin cards and its advantages, Stores ledger and its advantages. Method of pricing material issues- First in First out (FIFO) Method, Last in First out (LIFO) Method, Simple Average Method, Weighted Average Method,	12
Unit 5	**Wages (Theory and Numerical)** Concept of wages, Methods of wage Payment-Time rate system, Piece rate system. Incentive plans/Schemes-Halsey plan, Rowan plan and Taylor's differential piece rate system.	12

Suggested Readings-

1. Firoz Baig/Dilip Chavan, Cost Accounting, Vidya Books Publishers, Chh. Sambhajinagar.
2. Fundamental of Costing: S.N. Maheshwari
3. Practical Costing: Khanna Pande and Ahuja
4. M. N. Arora: Cost Accounting
5. CA (Dr.) P.C. Tulsian and CA Bharat Tulsian : Cost Accounting

Minor (Choose any one from each pool of course) It is different of the same faculty

Minor – MN-3				
SubjectTitle	**A] Business Communication**			
SubjectRef.No.	**BCA404T**	**No.ofCredits**	:	2
		No. of Periods / week	:	02/week
		Assignments/Sessional	:	20
		SemesterExamination	:	30

Course Objective: To develop foundational written and oral communication skills relevant to the corporate and professional environment.

CO #	Cognitive Level (BTL)	Course Outcomes
CO1	Understanding	Understand the principles, types, and levels of communication in business settings.
CO2	Applying	Apply effective writing techniques for reports, business letters, and email correspondence.
CO3	Creating	Create and deliver structured oral presentations with clarity and professionalism.

Unit 1	**Foundations of Business Communication** • Meaning, process, and functions of communication • Verbal & non-verbal communication • Formal vs. informal channels; upward, downward, lateral, diagonal flows • Barriers to communication and overcoming them • Listening as a communication tool – importance and techniques • Guidelines for effective listening and interpersonal interaction
Unit 2	**Professional Writing Skills** • Essentials of clear and effective business writing • Structure and components of formal reports • Drafting: Office memos, notices, circulars, and email communication • Email etiquette and professionalism in e-correspondence • Report writing: visit reports, annual report summarization, minutes of meetings • Referencing, citations, and footnotes (introductory level)
Unit 3	**Oral & Presentation Communication** • Elements and process of negotiation and group discussion • Telephonic and virtual conversation skills • Conducting and facing interviews professionally • Planning and delivering presentations • Structure, content, visuals, and delivery techniques • Features of impactful oral presentations

Suggested Readings

1. C.B. Gupta, *Essentials of Business Communication*, Sultan Chand & Sons
2. Kaul, A., *Effective Business Communication*, PHI Learning
3. Raman & Singh, *Business Communication*, Oxford University Press
4. R.C. Bhatia, *Business Communication*, Ane Books Pvt Ltd

Minor – MN-3				
SubjectTitle	**B] Life Skills**			
SubjectRef.No.	**BCA404T**	**No.ofCredits**	:	2
		No. of Periods / week	:	02/week
		Assignments/Sessional	:	20
		SemesterExamination	:	30

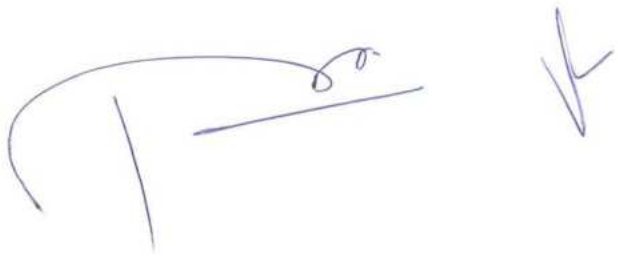
CO#	Cognitive Abilities	Course Outcomes
CO1	**Understand**	Develop self-awareness and empathy for building positive relationships.
CO2	**Apply**	Utilize critical and creative thinking skills for effective problem-solving.
CO3	**Analyse**	Learn to cope with stress, manage emotions, and set achievable personal goals.
CO4	**Communicate**	Improve verbal and non-verbal communication to enhance interpersonal relationships.

Unit 1	**Self-Awareness, Empathy, and Communication** **Topics Covered:** •**Self-Awareness**: Identifying personal strengths and weaknesses; building self-esteem. •**Empathy**: Understanding others' emotions and perspectives; the importance of empathy in relationships. •**Communication**: Developing effective verbal and non-verbal communication skills; building strong interpersonal relationships. **Activities:** • Breath awareness,Mindful observation,Guided meditations,Journaling,Emotional regulation exercises,Self-compassion activities,Empathy exercises etc to increase Self-awareness. •Empathy-building games: Role-playing activities to understand others' emotions and perspectives. •Communication: Enhancing listening skills and overcoming communication barriers through interactive scenarios.
Unit 2	**Critical Thinking, Creative Thinking, and Decision Making** **Topics Covered:** •**Critical Thinking**: Analysing and evaluating information; enhancing problem-solving and analytical abilities. •**Creative Thinking**: Fostering creativity, innovation, and thinking outside the box. •**Decision Making**: Understanding decision-making processes and models; making informed choices. **Activities:** • Critical and creative thinking exercises: Use puzzles, lateral thinking games, and idea-generation workshops. •Problem-solving activities: Group activities focused on solving real-world scenarios using creative approaches. •Decision-making case studies: Analyse real-life case studies to practice structured decision-making model

Unit 3	**Coping with Stress, Emotional Intelligence, and Goal Setting** **Topics Covered:** •**Coping with Stress**: Identifying stressors; exploring stress management techniques such as relaxation, time management, and mindfulness. •**Emotional Intelligence**: Recognizing and managing emotions; developing emotional resilience and regulation. •**Goal Setting**: Understanding and creating SMART goals (Specific, Measurable, Achievable, Realistic, Time-bound) for personal and professional growth. **Activities:** •Stress management workshops: Practice relaxation techniques like mindfulness, guided breathing, and physical exercises. •Emotional regulation activities: Exercises focused on managing anger, frustration, and practicing self-control. •Goal-setting workshops: Students create personal growth plans with actionable steps using the SMART framework.

Recommended Resources:

- **Handbook of Activities on Life Skills (Provided materials)**
- **Additional readings and case studies on life skills and emotional intelligence.**



Subject Title	:	**A] Quantitative Aptitude**		
Subject Ref. No.	:	**BCA-405T**	**No.of Credits:**	**2**
			No. of Periods / Week:	**30/02**
			Assignments /Sessional:	**20**
			Semester Examination:	**30**

Course Objectives

1. The main aim of introducing Quantitative Aptitude for computer Science student is to develop skill to meet the competitive examinations for job opportunity.
2. To enhance problem solving speed and accuracy, improve logical reasoning and build confidence in handling time bound assessments.
3. To prepare students for various competitive examinations, Aptitude test and also data driven decision making.

Course Outcomes(COs)

At the end of the course,
students will be able to:

CO-1	Slove the problems easily by using shortcut method with time management .
CO-2	Analyze the problem and approach one problem in different manner
CO-3	Improve Verbal & Non-verbal ability skill.
CO-4	Prepare for various public and private sector exams & placement drives.

PreRequisite	:	Basic Mathematics , reasoning skill
Unit–I	:	Problems on Ages – Percentage Profit and Loss – Ratio Proportion
Unit–II	:	Time and Distance – HCF and LCM Simple and Compound interest – Decimal Fraction and simplification
Unit–III	:	Odd man out from series – Verbal classification , Blood relations.
Text Book		R.S. Aggarwal, Quantitative Aptitude, S. Chand 2024
Reference Book		1. R.V. Parveen, Quantitative Aptitude and Reasoning 2nd Revised Edition 2013. Printice Hall of Indian Pvt Ltd. 2. Quantitative Aptitude for CAT by Arum Sharama, MC Graw Hill 2024.
Website		1. Javatpoint.com 2. https://www.geeksforgeeks.org/quantitative-aptitude/ 3. https://www.indiabix.com/aptitude/questions-and-answers/#google_vignette

MN-4					
Subject Title		**B] Event Management**			
Subject Ref. No.		**BCA405T**	**No. of Credits**		2
			No. of Periods / Week		30/2
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

At the end of the course, students will be able to:

1)	To appreciate the scope of Event Management
2)	To have a basic knowledge of Events
3)	The course designed to gain knowledge of emerging issues in Events.
4)	To study the problem arise in current situation how to take design on time and save the Management for further loss.
5)	Proper use of knowledge and Event management can help the student to organize the event.

Course Outcomes (COs)

CO-1	Remember the conceptual knowledge with an integrated approach to various functions of management.
CO-2	Develop skills in the student to organize the event
CO-3	Encourage and develop critical thinking, analysis and initiative ability skills to organize event.
CO-4	Encourage the student to organize the seminars and conference in academic section.

Pre Requisite	Basic understanding of Event Management will develop the ability of Organizing the event.	**Number of Lectures**
Unit – I	Introduction to historical perspective of event management, event management size &type of event team ,code of ethics. Event Planning: Aim of events ,develop a mission ,establish objective ,Preparing Event purposal ,use of planning tools.	

Unit -II	Special Events : Types and category ,Sports,Rallies,Academic events: Conference and seminars , Marketing in event : celebrities in Event Event communication &Presentation Skills: Written communication(official,demi official,Invoice,proposal) Verbal Communication. Presentation skills and use of computers in events.	
Unit – III	Basic Event Accounting : Budget, Break Even Point, cash flow analysis ,Profit and loss statement ,balance sheet ,Panic Payment Financial Control system.	
Text Books	Successful Event Management by: Anton shone and Bryn Parry. Business of Event Planning: Allen Judy .	
Additional Reference Books	Managerial Skill Development: Dr.Alex S.Chand Publication. Event Planner:Andrea L.Mortenson.	

GE/OE (Choose any one for other Faculty Students) GE/OE-04

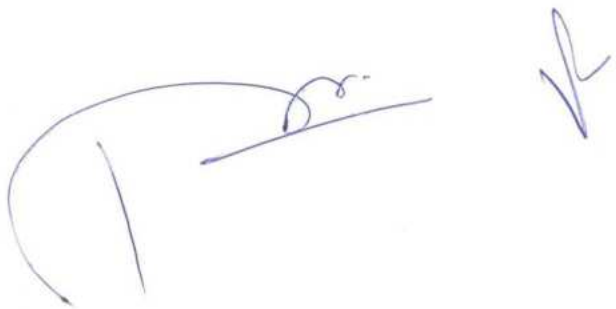
GE/OE-4					
Subject Title		**A] Advanced Networking**			
Subject Ref. No.		**BCA406T**	**No. of Credits**	:	2
			No. of Periods / Week	:	2
			Assignments / Sessional	:	20
			Semester Examination	:	30

Course Objectives

1)	Understand basic concepts of computer networks, types, and their advantages.
2)	Describe the structure and functioning of OSI and TCP/IP models.
3)	Apply knowledge of IP addressing, subnetting, and identify proper addressing schemes.
4)	Demonstrate the use of networking devices, protocols, and understand basic network security concepts.

Pre Requisite	NA	
Unit – I	Introduction to Computer Networks • What is a network? • Types of Networks: LAN, MAN, WAN, PAN • Advantages of Networking • Network Devices: Hub, Switch, Router, Modem Network Models • OSI Model – 7 Layers (basic overview) • TCP/IP Model – 4 Layers • Comparison between OSI and TCP/IP	
Unit – II	IP Addressing and Subnetting • What is an IP Address? • Types: IPv4 and IPv6 • Classes of IP Address • Concept of Subnetting (simple examples)	
Unit – III	Transmission Media and Protocols • Wired media: Twisted Pair, Coaxial, Fiber Optic • Wireless media: Wi-Fi, Bluetooth • Basic protocols: HTTP, FTP, TCP, UDP, IP	

	Internet and Network Security • How the Internet works • Firewalls and Antivirus • Basics of Encryption • Cyber Threats: Phishing, Malware, Hacking	
Text Books	**1. "Computer Networks"** **Author:** Andrew S. Tanenbaum (International author, but widely prescribed) **Indian Edition by:** Pearson Education India	
	2. "Data Communications and Networking" **Author:** Achyut S. Godbole **Publisher:** Tata McGraw-Hill	
Additional Reference Books	**1. "Data Communication and Networking"** **Author:** Sanjay Sharma **Publisher:** S.K. Kataria & Sons **2. "Computer Networks"** **Author:** Bhushan Trivedi **Publisher:** Oxford University Press	



GE/OE -4					
Subject Title		B] Linux			
Subject Ref. No.		**BCA406T**	**No. of Credits**		2
			No. of Periods / Week		2
			Assignments / Sessional		20
			Semester Examination		30

Course Objectives

At the end of the course, students will be able to:

1)	Understanding the basic set of commands and utilities in Linux systems.
2)	Learn the important Linux library functions and system calls

Course Outcomes (COs)

At the end of the course, students will be able to:

CO-1	Understanding the basic set of commands and utilities in Linux/UNIX systems.
CO-2	Learn the important Linux library functions and system calls

Pre Requisite		Operating System Concepts, Windows Platform	**Number of Lecture**
Unit – I		**Introduction:** Basic Linux System Concepts, GNU, Free Software, and Open Source Software, Open Source Software Licenses, Distributions of Linux O.S, Installing Ubuntu, The GNOME Desktop, Linux Commands	**10**
Unit – II		**Managing the basics:** User Administration, Linux File-System Administration, File Permissions, and Networking Management.	**10**
Unit – III		**SoftwareInstallation**: The Package Management, Vi/Vim Editor, Regular Expressions. Open SSH Server, VNC Server, Installation of Python.	**10**
Text Books		1. "Ubuntu Server Guide" by UBUNTU LTD. 2. "Introduction to Linux", A Hands on Guide by Machtelt Garrels "GNU/Linux Advanced Administration", by Josep Jorba Esteve and Remo Suppi Boldrito	

Skill Enhance Course (Choose any one) – SEC -3

Subject Title		**A] RDBMS Using Oracle** **B] RDBMS Using Oracle Lab**	**Total : 2 credit**	
Subject Ref. No.		**BCA407P A**	**No. of Credits**	1
			No. of Periods / Week	15 /1
			Assignments / Sessional	20
			Semester Examination	30

Course Objectives

At the end of the course, students will be able to:

1	Understanding advanced SQL and various complex queries
2	To make students understand about RDBMS architecture
3	To make students aware of cursors and Exception Handling
4	Have edge over Control and Iterative statements of PL/SQL

Course Outcomes (COs)

At the end of the course, students will be able to:

CO-1	Students will learn Fundamental Knowledge of Relational database model
CO-2	Student will learn about concept of SQL and concept of logic development in PL/SQL through conditional statement.
CO-3	To explain student about cursors and exception handling and demonstrate the concept by implementing to solve the problems.
CO-4	To understand concepts of data storage , retrieval and administration of the data in Relational Models using SQL

Skill Enhance Courses (SEC)

Pre Requisite		There is no prerequisites for attending this course	**No of Lecture**
Unit – I		Basic Concepts of Database, Data, Information, Database, Need of DBMS, Relational and ER Models : Data Models , Relational Model, Super keys, Candidate keys ,Primary keys and foreign key, Transactions**:** Locking Protocol, Serialisable Schedules , Locks Two Phase Locking (2PL), Deadlock and its Prevention, Optimistic Concurrency Control. Database Recovery and **Security** **Oracle 9i :Overview:**Personal Databases–Client/ServerDatabases–Oracle 9i an introduction, SQL*Plus Environment–SQL–Logging into SQL*Plus–SQL*Plus Commands	**5**
Unit – II		**PL/SQL: A Programming Language:** PL/SQL Overview, Benefits of PL/SQL Subprograms , Overview of the Types of PL/SQL blocks, Create a Simple Anonymous Block , Conditional processing Using IF Statements , Conditional processing Using CASE Statements , Use simple Loop Statement , Use While Loop Statement , Use For Loop Statement , Describe the Continue Statement, Use PL/SQL Records , The %ROWTYPE Attribute ,Insert and Update with PL/SQL Records , Associative Arrays (INDEX BY Tables) , Examine INDEX BY Table Methods , Use INDEX BY Table of Records	**5**
Unit – III		**PL/SQL Cursors and Exceptions:** Cursors, Implicit & Explicit Cursors and Attributes, Cursor FOR loops, SELECT…FOR UPDATE, WHERE CURRENT OF clause, Cursor with Parameters, Cursor Variables, Exceptions, Types of Exceptions, PL/SQL Composite Data Types: Records, Tables Procedures , Functions , Packages, Triggers ,Data Dictionary Views.	**5**

Text Books		1) An introduction to Database Systems: Bipin C. Desai, Galgotia Poblications Pvt. Ltd. 2) Ivan Bayross : SQL,PL/SQL The programming language of Oracle, 3rd revised edition, BPB Publications 3) Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database Systems Concepts", 7th Edition, McGraw Hill	
Additional Reference Books		1) Database system concepts –Henry F.Korth. 2) Oracle 9i Complete reference – Loney Koch – Tata Mc Graw Hill 2005.	

Subject Title		B] RDBMS Using Oracle Lab			
Subject Ref. No.		BCA407P A	No. of Credits		1
			No. of Periods / Week		30 /2
			Assignments / Sessional		20
			Semester Examination		30

List of Experiments:

7. Create a database and tables with proper data types and constraints.
8. Create a table with FOREIGN KEY relationship.
9. Write Simple PL/SQL Block structure program
10. Write a program to check ticket age wise with the use of IF-THEN-ELSIFELSE
11. Write a program to input three no and find out maximum and minimum from it.
12. Write a program to print first 1 to 10 numbers in reverse using for loop.
13. Write a PL/SQL statement to create procedure called p1 which accept a number & print multiply by 2 on the screen
14. Create a function for addition of two values
15. Create a package to display appropriate message.
10. Create a trigger to display salary changes in the customer table

SEC-4

SubjectTitle	**A] Web Services using XML** **1hr/week** **B] A] Web Services using XML Lab** **2 hr/week** **A+B = 2 credits**			
SubjectRef.No.	**BCA407P**			
		No.ofCredits	:	2
		No. of Periods / week	:	30/2
		Assignments/Sessional	:	20
		SemesterExamination	:	30

CourseOutcomes(COs)

At theendofthecourse,students willbeableto:

CO-1	To understand the concept of web services and xml
CO-2	To explore Key Technology and Standards of Web Services
Co-3	To Implement Web services in real time applications

CourseObjective	To learn how web services can be implemented in real time applications
Prerequisites	
UnitI	• Introduction to Web Services and XML: • What are web services and why are they important? • Introduction to XML and its role in web services. • Benefits of using XML over other data formats. • XML syntax, structure, and validation.
UnitII	• Key Technologies and Standards: • SOAP (Simple Object Access Protocol): • Understanding SOAP messages, structure (headers and body), and how they are used for communication between web services. • WSDL (Web Services Description Language): • Learning how WSDL is used to describe the functionalities and interfaces of web services. • UDDI (Universal Description, Discovery, and Integration): • Exploring how UDDI registries enable the discovery and access of available web services.

UnitIII	• Web Service Architecture and Design: • Service-Oriented Architecture (SOA): Understanding the principles of SOA and how it applies to web services. • Web service roles: Service requester, service provider, and service registry. • Web service operations: Publishing, finding, and binding web services. • Design patterns for web services: Exploring common design patterns used in web service development.
TextBook	Understanding Web Services: XML, WSDL, SOAP, and UDDI (Independent Technology Guides) -by Eric Newcomer (Author) XML, Web Services and the Data Revolution by Coyle (Author)
ReferenceBooks	
Website	https://www.w3schools.com/xml/xml_services.asp

B] Web Services using XML Lab

Development of Web Services

- Web Service Implementation: Creating web services using different programming languages (e.g., Java, Python, C#).
- Server-side Implementation: Developing server-side logic to handle requests and responses.
- Client-side Implementation: Creating clients to consume web services.
- Data Binding: Mapping data between objects and XML representations (e.g., JAXB for Java).
- Error Handling and Security: Implementing error handling mechanisms and basic security measures.

Web Service Testing and Deployment

- Testing Web Services: Using tools like SoapUI or Postman to test web service functionality.
- Deployment: Deploying web services to application servers (e.g., Tomcat, Jetty).
- Web Service Security: Understanding basic security concepts like authentication and authorization.

Practical Exercises

- The syllabus should include practical exercises for each topic to provide hands-on experience. Examples:
- Creating an XML document with a specific schema.
- Developing a simple SOAP-based web service to perform calculations.
- Creating a WSDL file for a given web service.
- Developing a client application to consume the web service.
- Testing the web service using SoapUI.
- Deploying the web service to an application server.

	AEC : Ability Enhancement Course (Choose any one – Modern Indian Languages)							
AEC4	BCA408T	Modern Indian Language MIL-2 (Common for all faculty)	02 hrs / per week	02	50	30	20	20
	OJT/FP/CEP/CC/RP							
CEP1	BCA409P	Community Engagement & Service	(04/per week)	02	50	30	20	20
CC4	BCA410P	Fine / Applied / Visual / Performing Arts ((Common for all faculty)	(04/per week)	02	50	30	20	20