VANITA VISHRAM WOMEN'S UNIVERSITY

(Managed By: Vanita Vishram, Surat)

1st Women's University of Gujarat

SCHOOL OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

BACHELOR OF COMPUTER APPLICATION (B.C.A.)

SYLLABUS

AS PER NEP-2020

W.E.F 2023-24

INDEX

1 PREAMBLE – VVWU

Vanita Vishram Women's University (VVWU) is the First-ever Women's University of Gujarat approved by the Government of Gujarat under the provisions of the Gujarat Private Universities Act, 2009. It is a university committed to achieve Women's Empowerment through Quality Education, Skill Development, and by providing employment opportunities to its girl students through its model curriculum, integration of technology in pedagogy and best-in-class infrastructure. The focus is on prioritizing practical component and experiential learning supported through academia-industry linkages, functional MoUs, skill development training, internships etc. It aims at providing opportunities to the girl students for holistic development and self-reliance.

VISION

Empowerment of women through quality education and skill development, so as to make them strong pillars of stability in the society.

MISSION

To provide Education & Professional Training to all women for their all-round development, so as to enable them to become economically independent and socially empowered citizens.

2 SALIENT FEATURES

- Based on NEP-2020 & CBCS

- Interdisciplinary as well as multidisciplinary.

- Practical-oriented, skill-based & vocation-based.

- Based on experiential learning.

- Greater exposure to internship, hands-on training, project work, field work, presentation etc.

- Mode of teaching shall be Offline.

- Qualified & Competent Faculty Members for effective teaching-learning

- Employment-Generating

3   INTRODUCTION OF THE PROGRAM

Bachelor of Computer Application is a UG program offered by VVWU. This course is of three years duration with two semesters in each year. The course is designed to make sure that students learn from basic computing to latest technologies in Computer Science & IT field. The curriculum offers perfect blend of theory and practical.

4   OBJECTIVES OF THE PROGRAM

The primary objective of a BCA program is to equip students with the skills and knowledge necessary for careers in the software industry and computer applications.

- To provide excellent computer training that will enhance logical programming and computing skills.
- To use innovative techniques for instruction, learning, and assessment.
- To promote creativity and the pursuit of superiority in computer applications.
- Give graduates exceptional leadership, communication, and problem-solving skills.

5 PROGRAM OUTCOMES (POs)

PO 1. Enable students to learn computer-assisted problem-solving techniques

Students can improve their knowledge of fundamental areas of computer science. Additionally, it enables students to build a conceptual understanding of domain-specific application development through problem-solving approach.

PO 2. Increased skills and analytical capacities of students

The course fosters the ability to think critically and analytically, solve problems, evaluate different problem-solving approaches, and grasp the core of a situation.

PO 3. Development of professional skills in Students

Students get trained in the most recent technology used in the field. For the departing students, the ongoing syllabus revision enhances the curriculum and prepares them for the demanding needs of the workplace.

PO 4. Increased knowledge of automation

The ability to use cutting-edge tools in the classroom allows students to solve difficulties in the actual world.

PO 5. Project Management and learning through Projects

The course gives students the tools they need to conceptualize the software architecture, plan and oversee the development of complex and active software projects. It enables the student's industry ready.

PO 6. The improvement of team leadership and project management

The students are competent in managing the project team and working together as a unit.

6 PROGRAM SPECIFIC OUTCOMES (PSOs)

Upon completion of the B.C.A. program, the students would:

PSO1 – Developing concept of the fundamentals of core logic development, problem solving

capabilities and effective communication.

PSO2 – The ability to analyze and apply latest technologies, coding concept and implementation

to solve the problems.

PSO3 – Team building and working with team with enhance mind set to improve

interpersonal skills.

PSO4 – Improve students capability to understand technical problems and solution through

various possibilities by enhancing critical thinking.

PSO5 – Development of technical proficiency by practical skills in software development

programming languages, databases, networking and other relevant technologies.

7 PROGRAM HIGHLIGHTS:

Program Level	UG				
Program	Bachelor of Computer Application				
Duration	3 years (6 semesters)				
Examination Type	Semester system (1-6 semesters)				
Intake	300				
Eligibility	Candidate must have Passed (10+2) examination with 45% is eligible for admission in BCA program.				
Mapping between POs and PSOs		PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
	PO 1.	▓				
	PO 2.	▓	▓			
	PO 3.			▓		
	PO 4.				▓	
	PO 5.			▓	▓	▓
	PO 6.				▓	▓
Job Positions	Project Manager, IT Manager, System Analyst, Technical Leaders, Software Consultant, Database Designer, Database Administrator, Application Programmer, Network Planning Manager, etc.				

8 SCHEME OF ASSESSMENT

Following is the scheme of assessment followed by the university –

Weightage (%)	Credit	Continuous Comprehensive Evaluation (CCE) (50%)	Semester End Evaluation (SEE) (50%)
100%	4	[Internal Exam] **(20)** + [1. Assignments/2. Project Work/ 3. Field Work/4. QUIZ / 5. group discussion/6. Role Play/ 7. (Lab Record/Lab Performance/Lab Work)/ 8. (Seminar/Class Performance/Poster Presentation) / 9. Viva-Voice/ 10. Book Review or Article Review/ 11. Case Studies/ 12. Class Test/ 13. Report Writing/ 14. Any other as per the requirement of the subject] (Any Two) (Thread-01 + Thread-02) **(10 + 10)** + [Attendance] **(10)**	Semester End Evaluation (SEE) Theory Exams Whole Syllabus
100%	2	[Internal Exam] **(20 - Converted into 10 at the time of marks entry)** + [1. Assignments/2. Project Work/ 3. Field Work/4. QUIZ / 5. group discussion/6. Role Play/ 7. (Lab Record/Lab Performance/Lab Work)/ 8. (Seminar/Class Performance/Poster Presentation) / 9. Viva-Voice/ 10. Book Review or Article Review/ 11. Case Studies/ 12. Class Test/ 13. Report Writing/ 14. Any other as per the requirement of the subject] (Any One) (Thread-01) **(10)** + [Attendance] **(5)**	Semester End Evaluation (SEE) Theory Exams Whole Syllabus

9 CREDIT STRUCTURE

BCA Credit structure for UG – 2023									
According to Curriculum and Credit Framework for Undergraduate Program									
Semester	Major	Minor	Multi-Disciplinary	Ability Enhancement Course (AEC)	Skill Enhancement Course (SEC)	Value Added Courses (VAC)/IKS	RP/OJT	Dissertation	Total
1	8	4	4	2	2	2	0	0	22
2	8	4	4	2	2	2	0	0	22
3	12	0	4	2	2	2	0	0	22
4	12	4	0	0	2	2	0	0	22
5	12	8	0	2	2	0	0	0	22
6	12	4	0	0	4	0	0	0	22
Total	**64**	**24**	**12**	**10**	**14**	**8**	**0**	**0**	**132**
7	12	4	0	0	0	0	6	0	22
8	12	4	0	0	0	0	6	0	22
Total	**24**	**8**	**0**	**0**	**0**	**0**	**12**	**0**	**44**
Grand Total	**88**	**32**	**12**	**10**	**14**	**8**	**12**	**0**	**176**
* If anyone wants to exit after 2nd/ 4th Sem and wants a certificate/Diploma respectively, should complete an internship of 4 credits (60 hrs.)									

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SCHOOL OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

BACHELOR OF COMPUTER APPLICATION (B.C.A.)

SEMESTER 2

SYLLABUS

AS PER NEP-2020

W.E.F 2023-24

10 COURSE STRUCTURE – PAPER TITLES SEMESTER 2

Sem	Discipline Specific Course (Major)	Discipline Specific Elective (Minor)	Interdisciplinary /Multi-Disciplinary Courses	Ability Enhancement Compulsory (AEC)	Skill Enhancement Courses (SEC)	Value Added Courses (VAC) / IKS	Summer Internship/ Project/ Online Course	Dissertation
2	Advanced C Programming (Theory)	Database Management System (Theory)	Computerized Financial Accounting	Functional English-II	Network Technology - I	Environmental Studies	-	-
	Advanced C Programming (Practical)							
	Operating System with UNIX (Theory)	Database Management System (Practical)						
	Operating System with UNIX (Practical)							

11 TEACHING AND EVALUATION SCHEME FOR B.C.A. ACADEMIC YEAR 2023-24

Semester	Course Code	Course Category	Course Title	Offering Department	Teaching Scheme - Contact Hour - Theory	Teaching Scheme - Contact Hour - Practical	Teaching Scheme - Contact Hour - Total	Total Credit	Examination Scheme - Theory - Credit	Theory - CCE - Max.	Theory - CCE - Passing	Theory - SEE - Max.	Theory - SEE - Passing	Theory - CCE+SEE Passing	Examination Scheme - Practical - Credit	Practical - CCE - Max.	Practical - CCE - Passing	Practical - SEE - Max.	Practical - SEE - Passing	Practical - CCE+SEE Passing	Total Marks	Total Credits
2	CAM203-1C	Discipline Specific Course (Major)	**Advanced C Programming (Theory)**	Computer Science	2	0	2	4	2	25	9	25	9	18	0	0	0	0	0	0	50	4
		Discipline Specific Course (Major) - Practical	**Advanced C Programming (Practical)**	Computer Science	0	4	4		0	0	0	0	0	0	2	25	9	25	9	18	50	
	CAM204-1C	Discipline Specific Course (Major)	**Operating System with UNIX (Theory)**	Computer Science	2	0	2	4	2	25	9	25	9	18	0	0	0	0	0	0	50	4
		Discipline Specific Course (Major) - Practical	**Operating System with UNIX (Practical)**	Computer Science	0	4	4		0	0	0	0	0	0	2	25	9	25	9	18	50	
	CAE202-1C	Discipline Specific Elective (Minor)	**Database Management System (Theory)**	Computer Science	2	0	2	4	2	25	9	25	9	18	0	0	0	0	0	0	50	4
		Discipline Specific Elective	**Database Management System (Practical)**	Computer Science	0	4	4		0	0	0	0	0	0	2	25	9	25	9	18	50	

	(Minor) – Practical																			
MDC202-1C	Interdisciplinary/Multi-Disciplinary Courses	**Computerized Financial Accounting**	Computer Science	4	0	4	4	4	50	18	50	18	36	0	0	0	0	0	0	100	4
AEC202-1C	Ability Enhancement Course (AEC)	**Functional English-II**	Computer Science	2	0	2	2	2	25	9	25	9	18	0	0	0	0	0	0	50	2
SEC202-1C	Skill Enhancement Courses (SEC)	**Network Technology - I**	Computer Science	2	0	2	2	2	25	9	25	9	18	0	0	0	0	0	0	50	2
VAC201-1C	Value Added Courses (VAC) / IKS	**Environmental Studies**	Computer Science	2	0	2	2	2	25	9	25	9	18	0	0	0	0	0	0	50	2
			TOTAL	-	-	-	22	16	-	-	-	-	-	6	-	-	-	-	-	550	22

12 SYLLABUS: SEMESTER 2

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
BCA Program
FY BCA
Semester II
CAM203-1C: Advanced C Programming (Theory)

Credit   4   **Contact Hours per week   2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major)
Purpose of Course	To study advance concepts about computer programming to explore and develop detail skills of programming.
Course Objective	Enable students to understand ● Introduce students to the essentials of computer Programming and programming methodology using structure, Union, Pointers, User Defined Functions and File management of C language. ● Apply various advanced programming constructs. ● Understand library and user defined functions.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	November 2023
Pre-requisite	NIL
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Medium of Instruction	English
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Unit 1. Introduction of Functions** 1.1 User Defined Functions 1.2 Structure of UDF 1.3 Function Prototype 1.4 Types of UDF 1.5 Recursive Function, Call by Reference & Call by Value 1.6 Variable Scope, Visibility and lifetime in function, Storage Classes 1.7 Command Line arguments	30%	10
2	**Unit 2. Structure & Union** 2.1 Defining Structure 2.2 Accessing a structure variable 2.3 Array of Structure and Array within structure 2.4 Defining Union 2.5 Comparison between Structure and Union.	25%	08
3	**Unit 3. Pointers** 3.1 Introduction to Pointers 3.2 Declaration and initialization 3.3 Pointer Arithmetic, Null pointers 3.4 Array and String using pointers. 3.5 Memory Allocation Function : malloc(), calloc(), recalloc(), Free()	25%	08
4	**Unit 4. File Management** 4.1 Defining and opening a file, Closing Files, Input/output Operations on Files. 4.2 Random Access and Sequential access to Files	20%	04

REFERENCE
Core references:

1. Programming in C, Balaguruswami – TMH
2. Let us C - 17th Edition, Yashavant Kanetkar, BPB Publication, Noida
3. C Language Programming – Byron Gottfried – TMH
4. The C Programming Language, Brian Kernigham & Dennis Ritchie, Prentice Hall Publications
5. C: The Complete Reference, Herbert Schildt, McGraw Hill Publications, Noida

Reference books:

1. C Programming Language, Kernigham& Ritchie – TMH
2. Programming in C, Stephan Kochan – CBS
3. Mastering Turbo C, Kelly & Bootle – BPB
4. Problem Solving with C, Somashekara – PHI

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	On completion of this course, student will understand the advanced concepts of C programming such as pointer, structure, union, UDF to design programs.
CO 2.	Ability to design and develop Computer programs, related to file management in C programs.
CO 3.	Interprets the concept of pointers, declarations, initialization, operations on pointers
CO 4.	Solve computational problems and file handling using C program using basic C language Constructs.

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes			
		CO 1.	CO 2.	CO 3.	CO 4.
1	Introduction of Functions	▓			
2	Structure & Union		▓		
3	Pointers			▓	
4	File Management				▓

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.	▓	▓			
CO 2.		▓	▓		
CO 3.	▓			▓	
CO 4.		▓	▓		▓

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
BCA Program
FY BCA
Semester II
Advanced C Programming (Practical)

Contact Hours per week   4

Outline of the Course:

Course type	Practical
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major) - Practical
Purpose of Course	**CAM203-1C: Advanced C Programming** ● Practical implementation of program covered as part of syllabus using required software and learning programming areas. ● Understanding and learning User defined Function, Structure, Union, Pointer and File Management.
Course Objective	**CAM203-1C: Advanced C Programming** ● Introduce students to the essentials of computer Programming and modular programming methodology using C language. ● Analyze C language code that uses pointer, File Handling. ● Apply various programming constructs. ● Understand library and user defined functions.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	November 2023
Pre-requisite	Basic of Programming, Spreadsheet and Database
Teaching Methodology	Lab work
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Ability to design and develop Computer programs, analyses, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.
CO 2.	Student will understand the fundamentals and applications logic in programming, data structures
CO 3.	Student will be able to write code in C language using concept of Structure and File Handling.
CO 4.	Solve computational problems using basic C language constructs.

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.					
CO 2.					
CO 3.					
CO 4.					

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
BCA Program
FY BCA
Semester II
CAM204-1C : Operating System with UNIX (Theory)

Credit   4   **Contact Hours per week   2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major)
Purpose of Course	To studying basic about Operating System to explore concepts and develop basic skills of operating System and Unix operating System.
Course Objective	Enable students to understand ● To understand functionality of Operating System. ● To make students aware with basic concepts of Unix OS.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	November 2023
Pre-requisite	Basic Computer Fundamental
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Medium of Instruction	English
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Unit 1. OS Introduction & Memory Management** 1.1 History Operating, Need of an Operating System, 1.2 Types & Function of Operating System, 1.3 Memory Management: Memory Allocation Techniques, 1.4 virtual Memory, Page replacement, 1.5 Thrashing.	30%	08
2	**Unit 2. Process & File Management** 2.1 Process Concept, process state diagram, PCB, 2.2 CPU Scheduling Algorithm, IPC, 2.3 Deadlocks: Prevention, Avoidance, Detection, Recovery, 2.4 File System: File Concept, Operations on File, File Access Methods, 2.5 Introduction of Directory Structure organization.	20%	07
3	**Unit 3. Introduction to UNIX Basics** 3.1 Overview of UNIX Architecture, 3.2 Directory Structure of UNIX, 3.3 Role & Function of Kernel and Shell, System Calls, 3.4 Basic UNIX commands, 3.5 Filters and Advanced filters commands	30%	08
4	**Unit 4. UNIX file system and Shell Programming** 4.1 Inode and File Structure, 4.2 File System Structure and Features, 4.3 File Access Permissions (chmod), 4.4 Display Beginning and End of files, Translating Characters, 4.5 Basic Shell Scripting.	20%	07

REFERENCE

Core references:

1. Modern Operating System 3rd Edition, 2008- Andrew Tanenbaum-PHI
2. Operating System Concepts, 6rd Edition, James Peterson Wesley Abraham Silberschatz- JOHN WILEY & SONS. INC
3. Operating System Concepts: – James Peterson: – McGraw Hill
4. Operating System: – Stallings – PHI
5. Operating System Principles: – Silberschatz, Galvin, Gagne - Willey, India

Reference books:

1. Operating Systems – A. S. Godbole – Tata McGraw Hill
2. Linux – The Complete Reference – Richard Petersen – Tata McGraw Hill
3. Linux –Application and administration, 2009 Edition, Ashok Kumar Harnal, TMH
4. Unix Concepts and Application- Sumitabha Das-MGH
5. Operating systems- Dhamdhere-MGH

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Learn the concepts of Operating System and its need for computer System. Students will know how the computer system internally work. Learn the concepts of Memory and its significance in computer System.
CO 2.	Students can Learn the multiple Process runs under the Computer System and how it executed. They work with OS File System and Directory Structure.
CO 3.	Learn the Unix OS and its interfaces and basic utilities.
CO 4.	Students are able to run the Unix and its various commands in Practical approach.

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes			
		CO 1.	CO 2.	CO 3.	CO 4.
1	OS Introduction & Memory Management	▓			
2	Process & File Management		▓		
3	Introduction to UNIX Basics			▓	
4	UNIX file system and Shell Programming				▓

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.	▓				
CO 2.	▓		▓		
CO 3.		▓		▓	
CO 4.				▓	▓

FYBCA Semester - II
Syllabus – 2023-24

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
BCA Program
FY BCA
Semester II
Operating System with UNIX (Practical)

Contact Hours per week   4

Outline of the Course:

Course type	Practical
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Course (Major) – Practical
Purpose of Course	**CAM204-1C: Operating System with UNIX** ● Practical implementation of program covered as part of syllabus using required software and learning Operating System areas. ● Understanding and learning basic concepts of UNIX operating System, commands, shell programming basics.
Course Objective	**CAM204-1C: Operating System with UNIX** ● To understand functionality of Operating System using UNIX. ● To make students aware with basic concepts of UNIX OS. ● Apply various programming constructs by shell scripts. ● Understand commands for filters and advanced filters.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	November 2023
Pre-requisite	Basic knowledge of Computer System
Teaching Methodology	Lab work
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

COURSE OUTCOMES:

Upon successful completion of the course,

| CO 1. | Learn the Unix Operating System environment and work on it. |
| CO 2. | Students can Learn the various commands and basic scripting practically to operate the system and application programs. |

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.					
CO 2.					

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
BCA Program
FY BCA
Semester II
CAE201-1C: Database Management System (Theory)

Credit   4   **Contact Hours per week   2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Elective (Minor)
Purpose of Course	● To provide comprehensive understanding of the basic concepts and principles of Data and storage. Understanding basic concepts of data, storage, retrieval and manipulation of data. Representation of data, analysis of data, graphical representation of data, statistical analysis of data. Basics of Structured Query Language of Database Management Systems for create, insert, update, retrieve and Manipulation of data using any opensource Software.
Course Objective	● To learn about the fundamental concepts of data, storage, retrieval and manipulation of data by query language, including data models, schema design, and the different types of databases. ● To learn statistical analysis of data.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2023
Pre-requisite	Concepts of data.
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Medium of Instruction	English
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Unit 1. Concepts of Database** 1.1 Conventional File Organization and its drawbacks 1.2 Introduction of Database and its Need. 1.3 Advantages of DBMS over File system. 1.4 Introduction of 3-Tier Architecture in DBMS 1.5 Data Abstraction and Data Independence (Logical and Physical)	10%	05

2	**Unit 2. Database Models and Keys**
	2.1 Database Models (Hierarchical, Network, E-R, Relational)
	    2.1.1 E-R model: Entity, Relationship, Attribute and Types of Attributes
	    2.1.2 Cardinality: One to one, one to many, many to one, many to many
	    2.1.3 Strong entity, weak entity
	2.2 Types of keys
	    2.2.1 Super key, candidate key, Primary key, Composite key, Foreign key, Unique key.
		35%	10

3	**Unit 3. Normalization** 3.1 Need of normalization (Insertion, Updating, Deletion anomalies) 3.2 Normal Forms 3.3 1NF, 2NF, 3NF, BCNF	20%	05

4	**Unit 4. Concepts of Structure Query Language (SQL)**
	4.1 SQL datatypes : int, float, double, char, varchar, number, varchar2, Text, date
	4.2 DDL Statements : Create , Drop, Truncate, Rename, Alter
	4.3 Constraints:
	    4.3.1 NOT NULL, CHECK, DEFAULT
	    4.3.2 UNIQUE, Primary Key, Foreign Key with On Delete Cascade
	4.4 DML(Insert, Update, Delete) and DQL(select) Statements :
	4.5 Using where clause and operators with where clause:
	    4.4.1 In, between , like, not in, =, !=, >, =, <=, wildcard operators
	    4.4.2 Order by, Group by, Having, Distinct
	    4.4.3 AND, OR operators, Exists and not Exists
	    4.4.4 Use of Alias
	    4.4.5 Join (inner Join, Outer Join)
	4.6 SQL Functions : Aggregate and Scalar
	4.7 Sequence and Views
		35%	10

REFERENCE
Core references:

1. Database System Concepts: – Henry F. Korth & Abrahim Silberschatz – McGraw Hill Education
2. Introduction to Database Management System– Bipin C. Desai – Galgotia Publication
3. Principles of database systems – Jeffery Ullman – Galgotia Publication

Reference books:

1. An introduction to Database Systems – C. J. Date – Addison Wesley
2. Introduction to database Management – Navin Prakash -TMH

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Learn the concepts of data and database management system for storing data.
CO 2.	After learning this subject, students will know how to store, retrieve and administer the data, graphical representation of data easily & efficiently using database.
CO 3.	Learn the concepts of how efficiently organize data in a database.
CO 4.	Students will able to work with database management systems to create, store, retrieve using SQL language.

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes			
		CO 1.	CO 2.	CO 3.	CO 4.
1	Concepts of Database	▓			
2	Database Models and Keys		▓		
3	Normalization			▓	
4	Concepts of Structure Query Language (SQL)				▓

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.	▓	▓			
CO 2.		▓	▓		
CO 3.			▓	▓	
CO 4.				▓	▓

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
BCA Program
FY BCA
Semester II
Database Management System (Practical)

Contact Hours per week   4

Outline of the Course:

Course type	Practical
Level of the Course	200-299 Intermediate-level
Course Category	Discipline Specific Elective (Minor) - Practical
Purpose of Course	**CAE202-1C: Database Management System** ● Practical based on Database Management System (DBMS) ● Practical implementation of Queries of SQL covered as part of syllabus using required software. ● Understanding and learning concepts of DBMS.
Course Objective	**CAE202-1C: Database Management System** ● To understand functionality of DBMS using Opensource SQL ● To make students aware with concepts of DBMS. ● Understand SQL for filtering records in database
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	November 2023
Pre-requisite	Spreadsheet and Database.
Teaching Methodology	Lab work
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Learn the concepts of data and database management system for storing data.
CO 2.	After learning this subject, students will know how to store, retrieve and administer the data, graphical representation of data easily & efficiently using database.
CO 3.	Learn the concepts of how efficiently organize data in a database.
CO 4.	Students will able to work with database management systems to create, store, retrieve using SQL language.

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.	▓	▓			
CO 2.		▓	▓		
CO 3.			▓	▓	
CO 4.				▓	▓

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
BCA Program
FY BCA
Semester II
MDC202-1C: Computerized Financial Accounting

Credit   4   Contact Hours per week   4

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Multidisciplinary
Purpose of Course	Describe accounting terms; finish the accounting cycle; create financial statements; evaluate and document company activities in a computerized setting; and apply accounting principles.
Course Objective	- Gain the knowledge and abilities required to perform general computer accounting for service and retail companies. - Finish the exercises utilizing the job cost, inventory, payroll, invoicing, accounts payable, and receivable systems. - Utilize open-source software to finish the accounting cycle. - Complete the financial statement analysis and prepare the financial statements.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	November 2023
Pre-requisite	Basic Knowledge of Computer Operating
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Medium of Instruction	English
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Unit 1. Introduction to Accounting** 1.1 Accounting Theory 1.2 Principles and Concepts 1.3 Accounting Equation 1.4 Control accounts 1.5 Bank reconciliation	20%	12
2	**Unit 2. Computerized Accounting** 2.1 Features of Computerized Accounting Systems 2.2 MIS and AIS 2.3 Types of Computerized Accounting Software 2.4 Advantages of Computerized Accounting Systems 2.5 Limitations of Computerized Accounting Systems	25%	15
3	**Unit 3. Spreadsheet for Accounting** 3.1 Debit/Credit Transactions 3.2 Cash Flow Statements 3.3 Bank reconciliation 3.4 Expense Transactions 3.5 Year Ending Statements	25%	15
4	**Unit 4. Budget and Costing Using Spreadsheet** 4.1 Estimated Budget Preparation 4.2 Product Cost Quotation 4.3 Invoice Generation	20%	10
5	**Unit 5: Case Study** 5.1 Payroll Package 5.2 Value Added Tax 5.3 Income Tax Return	10%	08

REFERENCE
Reference books:

1. Computerized Accounting – Dr. A Karim & Dr. S. S. Khanuja, Sanjay Sahitya Bhawan, SBPD Publishing House, Agra.

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Do financial accounting entries using computers.
CO 2.	Operate Open Source Software with ease
CO 3.	Create Accounts and Accounting Vouchers
CO 4.	Create Accounting Reports like – Trial Balance, Trading and Profit & Loss Account and Balance Sheet
CO 5.	Take back up of accounting records in software and also have knowledge about restoration of data

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes				
		CO 1.	CO 2.	CO 3.	CO 4.	CO 5.
1	Introduction to Accounting	■				
2	Computerized Accounting	■	■			
3	Spreadsheet for Accounting	■	■	■		
4	Budget and Costing Using Spreadsheet		■	■		
5	Case Study		■	■	■	■

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.	■	■			
CO 2.		■		■	
CO 3.				■	
CO 4.			■		■
CO 5.				■	

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
BCA Program
FY BCA
Semester II
AEC201-1C: Functional English-II

Credit   2   Contact Hours per week   2

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Ability Enhancement Course (AEC)
Purpose of Course	To equip individuals with the necessary language skills and confidence to communicate effectively in English, enabling them to succeed academically, professionally, and in various social settings
Course Objective	• Utilize their knowledge of functional English effectively for communicative purposes. • Learn language in authentic contexts. • Use English efficiently for routine. • Sharpen Writing and Speaking skills for better expression by providing authentic resources. Make students understand how the development of these skills will lead to their holistic development.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	November 2023
Pre-requisite	Elementary knowledge of English Language.
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Medium of Instruction	English
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Unit 1. Functional Grammar (Practical)** 1.1 The concept of mood in English grammar (indicative, imperative, subjunctive) 1.2 Time and tense relationships in complex sentences 1.3 Active and passive voice and their functions 1.4 Information structure (focus, topic, comment) in English	34%	10
2	**Unit 2. Introduction to Productive Skills** 2.1 Concept and Characteristics of Speaking 2.2 Qualities of a Good Public Speaker 2.3 Introduction to the Writing Skills 2.4 Concept and Characteristics of Writing	33%	10
3	**Unit 3. Productive Skills (Practical)** 3.1 Speaking in Public/ Group Discussion/ Debate 3.2 Dialogue Writing/ Speech Writing for various occasions 3.3 Paragraph/ Essay/ Report Writing	33%	10

REFERENCE
Core references:

1. "An Introduction to Functional Grammar" by M. A. K. Halliday and Christian M. I. M. Matthiessen
2. "Functional English Grammar: An Introduction for Second Language Teachers" by Michael A. K. Halliday and Ruqaiya Hasan
3. Gupta, S.C. English Grammar & Composition. Arihant Publication. 2022.
4. Mitra, Barun K. Personality Development and Soft Skills. Oxford University Press, 2015.
5. Urmila Rai and S.M. Rai. Business Communication. 1st Edition, Mumbai: Himalaya Publishing House.
6. Krishna Mohan and Meera Banerji. Developing Communication Skills. New Delhi: Macmillan India Private Ltd.
7. Wren and martin. English Grammar. MB publication, 2022.
8. Ur, Penny. Teaching Listening Comprehension. Cambridge University Press
9. Teaching Listening and Speaking : From Theory to Practice
https://www.professorjackrichards.com/wp-content/uploads/teaching-listening-and-speaking-from-theory-to-practice.pdf

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Enable themselves to comprehend ideas clearly and accurately with listening and reading skills.
CO 2.	Gain confidence in an academic and professional context.
CO 3.	Analyze and improve language skills. Prepare themselves better for placements and beyond.

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes		
		CO 1.	CO 2.	CO 3.
1	Functional Grammar (Practical)			
2	Introduction to Productive Skills			
3	Productive Skills (Practical)			

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.					
CO 2.					
CO 3.					

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
BCA Program
FY BCA
Semester II
SEC202-1C: Network Technology - I

Credit   2   **Contact Hours per week   2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Skill Enhancement Course (SEC)
Purpose of Course	To learn the various types of networks and layers and it's protocols and network devices features
Course Objective	- Understand the concept of data communication. - Understand the concepts and layers of OSI reference models. - Get familiar with different network components. - Get familiar with emerging networking trends and Tools - To make students understand and develop various Computer Networks models to establish computer and IT infrastructures.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	November 2023
Pre-requisite	NIL
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Unit 1. Introduction of Computer Network and Applications** 1.1 Types of Networks and its Topologies 1.2 Internetworks, Network software, Protocol hierarchies 1.3 Connection Oriented vs. Connectionless Service 1.4 Open System Interconnection (OSI)	30%	09
2	**Unit 2. Introduction to Transmission Media** 2.1 Guided Transmission Media (Twisted Pairs, Coaxial Cable, Fiber Optics) 2.2 Unguided Transmission Media (RFID, Radio Wave, Micro Wave, Infrared) 2.3 Satellite Communication	30%	09
3	**Unit 3. Network Devices** 3.1 Router 3.2 Bridge 3.3 Switches 3.4 Gateway 3.5 Access Point	30%	09
4	**Unit 4. Diagnose and troubleshooting in network** 4.1 Approaches to solve a connection problem 4.2 Install & Test Network Interface Card 4.3 Prepare and Test Straight and Cross UTP Cable. 4.4 Develop a small Network.	10%	03

REFERENCE
Core references:
1. Computer Networks Andrew S Tannebaum & David J Wetherall, Pearson, 2012. 2. Data Communication & Networking, Forouzen, Tata McGraw Hill. **Reference books:**
1. Data & Computer Communication, Williams Stallings, Prentice Hall of India. 2. Information Technology Today, S. Jaiswal, Galgotia Publications.

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Design simple computer networks.
CO 2.	Establish and Commission simple computer networks.
CO 3.	Identify and solve network operational problems.
CO 4.	Explain operations of Bridge,Router,Gateway.

FYBCA Semester - II
Syllabus – 2023-24

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes			
		CO 1.	CO 2.	CO 3.	CO 4.
1	Introduction of Computer Network and	☑			
2	Applications		☑		
3	Introduction to Transmission Media			☑	
4	Network Devices				☑

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.	☑	☑			
CO 2.		☑	☑		
CO 3.		☑		☑	
CO 4.			☑		☑

VANITA VISHRAM WOMEN'S UNIVERSITY, SURAT
SCHOOL OF SCIENCE AND TECHNOLOGY
Department of Computer Science
BCA Program
FY BCA
Semester II
VAC201-1C: Environmental Studies

Credit   2   **Contact Hours per week   2**

Outline of the Course:

Course type	Theory
Level of the Course	200-299 Intermediate-level
Course Category	Value Added Courses
Purpose of Course	The students need to learn basic concepts of environment. How environment impact our life on earth and which activities are harmful to our environment and how we can contribute to wellbeing of our earth and environment.
Course Objective	• To develop the understanding basics concept of our environment and its sustainable development. • Demonstrate knowledge and understanding different component of environment. • Demonstrate knowledge and understanding of the ecosystem and its • functioning and impact on survival of organism on earth. To develop the ability to think critically about sustainable • development of our earth environment.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	November 2023
Pre-requisite	10+2
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Evaluation Method	50% Continuous Comprehensive Evaluation (CCE) 50% Semester End Evaluation (SEE)

Course Content:

Units	Particulars	% Weightage of Unit	Minimum Nos. of Hours
1	**Unit 1. Introduction of Environment** 1.1 Definition and multidisciplinary nature of environmental studies. 1.2 Concept and Components of environment (Atmosphere, Lithosphere and Hydrosphere) 1.3 Bio-geochemical cycles 1.4 Concept, structure and function of an ecosystem. 1.5 Food chains, food webs and Energy flow in an ecosystem 1.6 Terrestrial ecosystem: Forest ecosystem and Grassland ecosystem 1.7 Aquatic ecosystems: Pond and ocean ecosystem	25%	08
2	**Unit 2. Natural Resources: Renewable and Non-renewable Resources** 2.1 Land as a resource, soil erosion and land degradation, landslides, and desertification 2.2 Forests: Use and over-exploitation, deforestation, 2.3 Impacts of deforestation on biodiversity and tribal populations. 2.4 Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs	25%	08
3	**Unit 3. Biodiversity and its Conservation** 3.1 Introduction — Definition, ecosystem diversity, Value of biodiversity, 3.2 India as a mega-biodiversity nation; 3.3 Threats to biodiversity: Habitat loss, poaching of wildlife, man- wildlife conflicts. 3.4 Endangered and endemic species of India. Common plant and animal species. 3.5 Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity	25%	07
4	**Unit 4. Environmental pollution** 4.1 Definition Causes, effects and control measures of: 4.4.1 Air pollution 4.4.2 Water pollution 4.4.3 Soil pollution 4.4.4 Marine 4.4.5 Noise pollution 4.4.6 Thermal pollution 4.4.7 Nuclear hazards	25%	07

REFERENCE

Reference books:
1. Bharucha, E. (2013). Textbook of Environmental Studies for Undergraduate Courses. Universities Press.
2. Asthana, D. K. (2006).Text Book of Environmental Studies. S. Chand Publishing.
3. Basu, M., Xavier, S. (2016). Fundamentals of Environmental Studies, Cambridge University Press, India
4. Singh, J.S., Singh, S.P. & Gupta, S.R. 2006. Ecology, Environment and Resource Conservation. Anamaya Publications.
5. Sodhi, N.S. & Ehrlich, P.R. (Eds). 2010. Conservation Biology for All. Oxford University Press.
6. Tiwari, G.N. & Ghosal. M. K. 2005. Renewable Energy Resources: Basic Principles and Application. Narosa Publishing House.
7. R. K. Khitoliya., 2012. Environmental Pollution 2nd edition.S. Chand Publishing
8. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2006. Environmental and Pollution Science. Elsevier Academic Press.
9. Purohit, S.S. & Ranjan, R. 2007. Ecology, Environment & Pollution. Agrobios Publications.

COURSE OUTCOMES:

Upon successful completion of the course,

CO 1.	Students will gain knowledge about Earth structure and its environment and ecology and biodiversity and its role in human welfare and its conservation
CO 2.	Students will develop the understanding about various natural resources and their management.
CO 3.	Students will be able to critically examine all sides of environmental issues and apply understanding from various disciplines such as psychology, law, literature, politics, sociology, philosophy, and religion to create opinions about how to interact with the environment on both a personal and a social level.
CO 4.	Students will understand the global character of environmental problems and ways of addressing them, including interactions across local to global scales

COURSE OUTCOMES MAPPING

Unit No.	Title of the Unit	Course Outcomes			
		CO 1.	CO 2.	CO 3.	CO 4.
1	Introduction of Environment	▨			
2	Natural Resources: Renewable and Non-renewable Resources		▨		
3	Biodiversity and Conservation			▨	
4	Environmental pollution			▨	▨

COURSE ARTICULATION MATRIX

	PSO 1.	PSO 2.	PSO 3.	PSO 4.	PSO 5.
CO 1.					
CO 2.					
CO 3.					
CO 4.					

13 TEACHING METHODOLOGY

A teaching method comprises the principles and methods used by teachers to enable student learning. In order to achieve its objective of focused process- based learning and holistic development, the teacher/faculty may use a variety of knowledge delivery methods:

13.1 LECTURES/CLASS WORKS:

Lectures should be designed to provide the learners with interesting and fresh perspectives on the subject matter. Lectures should be interactive in a way that students work with their teachers to get new insights in the subject area, on which they can build their own bridges to higher learning. Classwork has the ability to enhance relationships between teachers and students. Create goal- oriented tasks for students to prepare and enable self-learning.

13.2 DISCUSSIONS/ SEMINARS/PRESENTATION:

Discussions / seminars / presentation are critical components of learning and can be used as a platform for students to be creative and critical with old and new ideas. Besides developing critiquing skills, arriving at consensus on various real-life issues and discussion groups lead to innovative problem-solving and ultimately to success.

13.3 CASE STUDIES/ SELF-STUDY:

Real case studies, wherever possible, should be encouraged in order to challenge students to find creative solutions to complex problems of individual, community, society and various aspects of knowledge domain concerned. Technology is transforming higher Education learning and teaching though various case studies to improve overall standards.

13.4   PRACTICAL/PROBLEM SHEET:

Practical ability is the essential requirement for computer science undergraduates' ability structure, and it emphasizes that computer science undergraduates should have a good grasp of theory from practice and then apply the theory to practice, improving them own software developing skills and employ ability.

13.5   ASSIGNMENTS:

Computer science assignments not only help students overcome their fear and stress but also help them learn more interesting facts about the subjects of computer science which are part of their syllabus and also out of curriculum.

13.6   INDUSTRIAL TOURS:

Computer Science students have to know the things practically through interaction, working methods and employment practices. Moreover, it gives exposure from academic point of view. Main aim industrial visit is to provide an exposure to students about practical working environment.

13.7   TEAM WORK:

Teamwork based projects challenge the student to apply the technical knowledge they gain in college to solve meaningful and complex problems. Positive collaboration in the form of team work is critical in the classroom environment, for which it is necessary to transcend one's prejudices and predilections so as to achieve the desired outcomes. In the process of team work, learners will acquire the skills of managing knowledge acquisition and other collaborative learners, thereby understanding how to incorporate and balance personalities.

14 KEYWORDS

- Bachelor of computer Application (B.C.A)
- Basics Of Computers
- Office Automation
- Operating System
- Web Development
- Programming Concept
- Database-backend tool
- Web Designing
- Statistical analysis
- Internet
- Algorithms
- Software analysis, coding, design, testing
- Mobile Computing
- Cyber Security
- IT Projects
- Network fundamentals
- Framework
- Frontend tools
- Animation
- Graphics fundamentals