

Detailed Program Scheme
Bachelor of Computer Applications
(BCA)

Semester-III
(2022-2025)

DOC202205260006



RNB GLOBAL UNIVERSITY

RNB Global City, Ganganagar Road,
Bikaner, Rajasthan 334601

OVERVIEW

RNB Global University follows Semester System along with Choice Based Credit System as per latest guidelines of University Grants Commission (UGC). Accordingly, each academic year is divided into two semesters, **Odd (July-December) and Even (January-June)**. Also, the university follows a system of continuous evaluation along with regular updating in course curricula and teaching pedagogy.

The curriculum for BCA Program for (July-December) Odd Semester, 2023 along with examination pattern is as follows:

Course Scheme

Semester -III

S. No	Course Code	Course Name	L	T	P	Credits
1.	13013800	Python	3	0	0	3
2.	13032800	Python Lab	0	0	2	1
3.	13008200	Database Management System	3	0	0	3
4.	13008300	Database Management System Lab	0	0	2	1
5.	13008400	Computer Architecture	3	1	0	4
6.	13008500	Object Oriented Programming with C/C++	3	1	0	4
7.	13008600	Object Oriented Programming with C/C++ Lab	0	0	4	2
8.	13033000	Principal of Accounting	3	0	0	3
9.	13002900	Ability & Skill Enhancement - III	2	0	0	2
10.	99003300	Human Values & Social Service/NCC/NSS	-	-	-	1
Total			17	2	8	24

EVALUATION SCHEME- THEORY

The evaluation of the theory paper of BCA would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessments as follows:

Internal Assessment

The distribution of Internal Assessment Marks is as follows:

Type	Details	Marks
Mid Term	Two Mid-term Sessional of 15 marks each (15+15)	30
Marks obtained in various Tests, Assignments, Presentations, Quiz, Tutorials, etc.	Average of marks obtained	15
Attendance	75%+ : 5 marks	5
TOTAL	50	

External Assessment

Type	Marks
Theory	50

EVALUATION SCHEME -PRACTICAL

The evaluation of the practical paper of BCA would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessment is as follows:

Internal Assessment

Type	Details	Marks
Marks obtained in various manuals, practical file, participation, any model prepared, output of practical	Average of marks obtained	45
Attendance	75%+ : 5 marks	5
TOTAL	50	

External Assessment

Type	Marks
Practical	50

EVALUATION SCHEME- WORKSHOPS & SEMINARS AND HUMAN VALUES & SOCIAL SERVICE/NCC/NSS

1. The evaluation of Workshops & Seminar and Human Values & Social Service/NCC/NSS will be completed from Semester I – Semester VI. It will be evaluated internally by the various Forums & Schools Concerned. The credit for this will be given at the end of each Semester.
2. The students have to join club/clubs/Forums with the active participation in different activities of club. The students would be continuously assessed from Semester-I to Semester-IV and credits and marks would be given after the end of each Semester.

CURRICULUM

Course Name: Python

Course Code: 13013800

Unit-wise Syllabus

UNIT - I

Planning the computer program: concept of problem solving, problem definition, program design, debugging, types of errors in programming, documentation. Techniques of problem solving: flowcharting, decision table, algorithms, structured programming concepts, programming methodologies viz. Top-down and bottom-up programming. Overview of programming: structure of a python program, elements of python.

UNIT – II

Introduction to python: python interpreter, using python as calculator, python shell, indentation. Atoms, identifiers and keywords, literals, strings, operators (arithmetic operator, relational operator, logical or Boolean operator, assignment, operator, ternary operator, bit wise operator, increment or decrement operator) Creating python programs: input and output statements, control statements(branching, looping, conditional

statement, exit function, difference between break, continue and pass.), defining functions, default arguments, errors and exceptions. Iteration and recursion: conditional execution, alternative execution, nested conditionals, the return statement.

UNIT - III

Recursion, stack diagrams for recursive functions, multiple assignment, the while statement, tables, two-dimensional tables Strings and lists: string as a compound data type, length, traversal and the for loop, string slices, string comparison, a find function.

UNIT – IV

Looping and counting, list values, accessing elements, list length, list membership, lists and for loops, list operations, list deletion. Cloning lists, nested lists Object oriented programming: introduction to classes, objects and methods, standard libraries.

UNIT - V

Data structures: arrays, list, set, stacks and queues. Searching and sorting: linear and binary search, bubble, selection and insertion sorting.

REFERENCES:

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

Course Name: Python Lab

Course Code: 13032800

LIST OF PRACTICAL'S:

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

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

Course Name: Database Management System

Course Code: 13008200

Objectives

- To understand the different issues involved in the design and implementation of a database system.
- To study the physical and logical database designs, database modeling, relational, hierarchical, and network models.
- To understand and use data manipulation language to query, update, and manage a database.
- To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency.
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

Course Outline

Unit I : Introduction

An overview of database management system, database system Vs file system, Characteristics of database approach, DBMS architecture, data models, schema and instances, data

independence. **Data Modeling using Entity Relationship Model:** Entity, Entity types, entity set, notation for ER diagram, attributes and keys, Concepts of composite, derived and multivalued attributes, Super Key, candidate key, primary key, relationships, relation types, weak entities, enhanced E-R and object modelling, Sub Classes:, Super classes, inheritance, specialization and generalization.

Unit II: Introduction to SQL

Overview, Characteristics of SQL. Advantage of SQL, SQL data types and literals. Types of SQL commands: DDL, DML, DCL. Basic SQL Queries. Logical operators :BETWEEN, IN, AND, OR and NOT Null Values: Disallowing Null Values, Comparisons Using Null Values Integrity constraints: Primary Key, Not NULL, Unique, Check, Referential key Introduction to Nested Queries, Correlated Nested Queries, Set-Comparison Operators, Aggregate Operators: The GROUP BY and HAVING Clauses, Joins: Inner joins, Outer Joins, Left outer, Right outer, full outer joins. Overview of views and indexes.

Unit III

Relational Data Model: Relational model terminology domains, Attributes, Tuples, Relations, characteristics of relations, relational constraints domain constraints, key constraints and constraints on null, relational DB schema. Codd's Rules Relational algebra: Basic operations selection and projection, Set Theoretic operations Union, Intersection, set difference and division, Join operations: Inner , Outer ,Left outer, Right outer and full outer join.ER to relational Mapping: Data base design using ER to relational language. Data Normalization: Functional dependencies, Armstrong's inference rule, Normal form up to 3rd normal form.

Unit IV

Transaction processing and Concurrency Control: Definition of Transaction, Desirable ACID properties, overview of serializability, serializable and non-serializable transactions Concurrency Control: Definition of concurrency, lost update, dirty read and incorrect summary problems due to Concurrency Control Techniques: Overview of Locking, 2PL, Timestamp ordering, multi versioning, validation Elementary concepts of Database security: system failure, Backup and Recovery Techniques, authorization and authentication.

Suggested Readings:

1. R. Elmarsri and SB Navathe, "Fundamentals of Database Systems", Pearson, 5th Ed.
2. Singh S.K., "Database System Concepts, design and application", Pearson Education
3. Ramakrishnan and Gherke, "Database Management Systems", TMH.
4. Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database Systems Concepts", 4th Edition, McGraw Hill, 1997.
5. Jim Melton, Alan Simon, "Understanding the new SQL: A complete Guide", Morgan Kaufmann Publishers, 1993.
6. K. Majumdar, P. Battacharya, "Data Base Management Systems", TMH, 1996.
7. Bipin Desai, "An Introduction to database Systems", Galgotia Publications, 1991.

Course Name: Database Management System Lab

Course Code: 13008300

Objectives

The aim of this course to make student understand about the practical uses of database.

Course Outline

List of the Programs not limiting to:

1. Creating Database

- a. Creating a Database
- b. Creating a Table
- c. Specifying Relational Data Types
- d. Specifying Constraints
- e. Creating Indexes

2. Table and Record Handling

- a. INSERT statement
- b. Using SELECT and INSERT together
- c. DELETE, UPDATE, TRUNCATE statements
- d. DROP, ALTER statements

3. Retrieving Data from a Database

- a. The SELECT statement
- b. Using the WHERE clause
- c. Using Logical Operators in the WHERE clause
- d. Using IN, BETWEEN, LIKE , ORDER BY, GROUP BY and HAVING

4. Clause

- a. Using Aggregate Functions
- b. Combining Tables Using JOINS
- c. sub- queries

5. Database Management

- a. Creating Views
- b. Creating Column Aliases
- c. Creating Database Users
- d. Using GRANT and REVOKE

Course Name: Computer Architecture

Course Code: 13008400

Objectives

- The fundamental concepts underlying modern computer architecture. Main objective of the course is to familiarize students about hardware design including logic design, basic structure and behavior of the various functional modules of the computer and how they interact to provide the processing needs of the user. It will cover machine level representation of data, instruction sets, computer arithmetic, CPU structure and functions, memory system organization and architecture, system input/output, multiprocessors, and digital logic. The emphasis is on studying and analysing fundamental issues in architecture design and their impact on performance.

Course Outline:

Unit I: Basics of Digital Electronics

Codes, Logic gates, Flip flops, Registers, Counters, Multiplexer, De multiplexer, Decoder, Encoder. **Register Transfer and Micro operations:** Register transfer Language, Register transfer, Bus & memory transfer, Logic micro operations, Shift micro operation. **Basic Computer Organization:** Instruction codes, Computer instructions, Timing & control, Instruction Cycles, Memory reference instruction, Input/output & Interrupts, Complete computer description & design of basic computer.

Unit II: Control Unit

Hardwired vs. Micro programmed control unit. **Central Processing** General register organization, Stack organization, Instruction format, Data transfer & manipulation, Program control, RISC, CISC.

Computer Arithmetic: Addition & subtraction, Multiplication Algorithms, Division algorithms.

Unit III: Input-Output Organization

Peripheral devices, I/O interface, Data transfer schemes, Program control, Interrupt, DMA transfer, I/O processor.

Memory Unit: Memory hierarchy, Processor vs. memory speed, High-speed memories, Cache memory, Associative memory, Interleave, Virtual memory, Memory management.

Unit IV: Introduction to Parallel Processing

Pipelining, Characteristics of multiprocessors, Interconnection structures, Inter processor arbitration, Inter processor communication & synchronization.

Suggested Readings

1. Mano, Morris M., Computer System Architecture, Prentice Hall (1992) 3rd ed.
2. Hayes, J.P., Computer Architecture and Organization, McGraw Hill (1998) 3rd ed.
3. Hennessy, J.L., Patterson, D.A, and Goldberg, D., Computer Architecture A Quantitative Approach, Pearson Education Asia (2006) 4th ed.
4. Leigh, W.E. and Ali, D.L., System Architecture: software and hardware concepts, South Wester Publishing Co. (2000).

Course Name: Object Oriented Programming in C/C++

Course Code: 13008500

Objectives

- To provide an overview of the various business process, analyze operations, production planning.

Course Outline

Unit I

Review: Review of basic concepts of object-oriented programming, Comparison between procedural programming paradigm and object-oriented programming paradigm. Classes and Objects: Specifying a class, Creating class objects, Accessing class members, Access specifiers – public, private, and protected, Classes, Objects and memory, Static members, The const keyword and classes, Static objects, Friends of a class, Empty classes, Nested classes, Local classes, Abstract classes, Container classes, Bit fields and classes.

Unit II

Console Based I/O: Concept of streams, Hierarchy of console stream classes, Input/output using Overloaded operators >> and << and Member functions of I/O stream classes, Formatting Output, Formatting using ios class functions and flags, Formatting using manipulators. Constructors and Destructors: Need for constructors and destructors, Copy constructor, Dynamic constructors, Destructors.

Unit III

“for”, “while” and “do – while” loops, break and continue statement, nested control statement, value returning functions, void functions, value versus reference Parameters, local and global variables, static and automatic variables, enumeration type, one dimensional array, two dimensional array, character array, pointer data and pointer variables.

Unit IV

Object Oriented Concepts: Abstraction, encapsulation, inheritance and its types, static and dynamic binding, overloading. Program Development: Object oriented analysis, design, unit testing & debugging, system testing & integration, maintenance.

Virtual Functions and Polymorphism: Concept of Binding - Early binding and late binding, Virtual functions, Pure virtual functions, Abstract classes, Virtual destructors & polymorphism.

Suggested Readings:

1. Lippman, S.B. and Lajoie, J., C++Primer, Pearson Education (2005) 4th ed.
2. Stroustrup, Bjarne, The C++ Programming Language, Pearson Education (2000)3rd ed.
3. Eills, Margaret A. and Stroustrup , Bjarne, The Annotated C++ Reference Manual, Pearson Education (2002).
4. Rumbaugh, J.R., Premerlani, W. and Blaha, M., Object Oriented Modeling and Design with UML, Pearson Education (2005) 2nd ed.
5. Kanetkar, Yashvant, Let us C++, Jones and Bartlett Publications (2008) 8th ed

Course Name: Object Oriented Programming in C/C++ Lab

Course Code: 13008600

Objectives

To provide an overview of the various business process, analyze operations, production planning.

Course Outline

List of Programs

1. WAP to print the sum and product of digits of an integer.
2. WAP to reverse a number.
3. WAP to compute the sum of the first n terms of the following series $S = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4}$
4. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.
5. WAP to compute the factors of a given number.
6. Write a program that swaps two numbers.
7. WAP to print a triangle of stars as follows (take number of lines from user):

```

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

8. WAP to perform following actions on an array entered by the user: i) Print the even-valued elements ii) Print the odd-valued elements.
9. Calculate and print the sum and average of the elements of array
10. Print the maximum and minimum element of array
11. Write a program that swaps two numbers using pointers.

12. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
13. WAP to display Fibonacci series using recursion.
14. WAP to display Fibonacci series using iteration.
15. WAP to calculate Factorial of a number using iteration
16. WAP to calculate Factorial of a number using recursion
17. Create Matrix class using templates. Write a menu-driven program to perform following Matrix operations (2-D array implementation): a) Sum b) Difference
18. Create a class Box containing length, breath and height. Include following methods in it:
 - a) Calculate surface Area
 - b) Calculate Volume
19. Create a class Triangle. Include overloaded functions for calculating area. Overload assignment operator and equality operator.
20. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.

CourseName: Principles of Accounting

Course Code: 13033000

Objectives

- To provide an overview of the various Principle of Accounting and main objective of study of accounting process and cycle, analyze operations and profit planning.
- To get the Knowledge about the important concepts and characteristics of accounting.
- To study the application of accounting in the general business environment.

Course Outline

Unit I

Meaning and nature of accounting, Scope, Objectives & Limitations financial accounting, Distinction between Accounting & Book Keeping, Interrelationship of Accounting with other disciplines, Branches of Accounting, Accounting concepts and convention, accounting standards in India.

Unit II

Accounting Equation, Journal, Rules of Debit and Credit, Sub Division of Journal: Cash Journal, Petty Cash Book, Purchase Journal, Purchase Return, Sales Journal, Sales Return Journal, Ledger, Trial Balance, **Errors - Types - Rectification of Errors - Bank Reconciliation Statement.**

Unit III

Preparation of Trading Account, Profit & Loss Account & Balance Sheet- Without adjustments and with adjustments.

Unit IV

Meaning of Inventory, Objectives of Inventory Valuation, Inventory Systems, Methods of Valuation of Inventories-FIFO, LIFO and Weighted Average Method, Concept of Depreciation, Causes of Depreciation, Meaning of Depreciation Accounting, Method of Recording Depreciation, Methods of Providing Depreciation.

Unit-V

Accounting in Computerized Environment: Introduction to Accounting Software Package - Tally Prime An overview of Computerized Accounting systems - Salient Features and significance, Generating Accounting Reports.

Suggested Readings:

1. Maheshwari, S.N. and Maheshwari, S. K., (2009) An Introduction to Accountancy ,Eighth Edition, Vikas Publishing House.
2. Tulsian, P.C., (2009) Financial Accountancy, 2nd edition, Pearson Education.
3. Gupta R. L., & Gupta V.K., "Principles & Practice of Accounting", Sultan Chand & Sons, 1999.
4. Monga J R, "Introduction to Financial Accounting", Mayur Paperbacks, 2010.
5. Raja Sekaran/Lalitha, "Financial Accounting", Pearsons .

Course Name: Ability & Skill Enhancement III

Course Code: 13002900

Objectives

- Besides making English Learning an interesting activity, the curriculum aims to develop and enhance creativity of the students.

Course Outline - Final Assessment – Preparing a documentary

Unit I : Book & Movie Reviews

What is Book Review, Purpose & Importance of Book Review, Types of Book Review, Elements & Steps of Writing Book Review, What is Movie Review, Purpose & Importance of Movie Review, Types of Movie Review, Elements & Steps of Writing Movie Review.

Unit II: LSWR Skills

Reading Comprehension, Rewriting Mythology/Folklore, Debate, News Analysis, Role Plays.

Unit III : Emotional Intelligence & Handling Emotions

What is emotional intelligence, E.Q. Tests, performing under pressure, how to take right decisions under pressure keeping balance in difficult emotional situations. The science of emotional intelligence, characteristics of emotional intelligence, Emotions handling- identifying good and bad emotions, how to control emotions, how to manage negative emotions keeping balance of mental stability, stress and distress.

Unit IV: Group Discussion Skills

What is GD, Types of Group Discussions, Do's & Don'ts, Participation, Thinking, Structuring, Group Behaviour, Leadership Skills, Interpersonal Skills, Persuasive Skills, Conceptualization Skills.

Unit V: Documentary Making

What is documentary, aims & objectives, documentary for social cause, Documentary/Movie Screening & Reviews, preparing a documentary, Narration.

Note: The review of Syllabus happens on periodic basis for the benefit of the students. In case there are changes in curriculum due to review, students would be intimated in writing.

----- End of document-----