DEPARTMENT OF COMPUTER SCIENCE

COURSE CURRICULUM & MARKING SCHEME

BCA PART - III

(BACHELOR OF COMPUTER APPLICATION)

SESSION : 2023-24

ESTD: 1958

GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG, 491001 (C.G.)

(Former Name – Govt. Arts & Science College, Durg)

NAAC Accredited Grade A+, College with CPE - Phase III (UGC), STAR COLLEGE (DBT)

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GOVT. V.Y.T. P.G. AUTO. COLLEGE, DURG (C.G.)
SYLLABUS FOR: (2023-24)
BCA – PART III
SUBJECT CODE: BCA -301
STATISTICAL ANALYSIS

Max Marks: 80 **Min Marks: 27**

Note: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculators allowed not scientific calculator.

Course Objective: This course is designed to provide students with an understanding of the data and its relevance in business and develop an understanding of the quantitative techniques from statistics.

Course Outcome: Upon successful completion of this course, students will be able to:

- Organize, manage and present data.
- Analyze statistical data graphically using frequency distributions and cumulative frequency distributions.
- Apply the rules and algorithm of probability and statistics in various logical problems.
- Analyze statistical data using measures of central tendency, dispersion and location.
- Mathematical probabilistic models for different problems, to analyze them and to interrupt the results.

UNIT-I

COMBINATORICS: Permutation and Combination, Repetition and Constrained Repetition, Binomial Coefficients, Binomial Theorem.

UNIT-II

Frequency distributions, Histograms and frequency polygons, Measures of central tendency: Mean, Mode, Median, Dispersion, Mean deviation and standard deviation. Moments, Skewness, kurtosis.

UNIT—III

Elementary probability theory: Definition, conditional probability, Probability distribution, mathematical expectation.

Theoretical distribution: Binomial , Poisson and Normal distribution, Relation between the binomial, poisoned Normal distribution.

UNIT-IV

Correlation and Regression: Linear Correlation, Measure of Correlation, Least Square Regressionlines.

Curve fitting: Method of least square, least square line, least squares Parabola. Chi-square test: definition of chi-square; signification test: contingency test, coefficient of contingency.

UNIT-V

Basic of sampling theory: Sample mean and variance, students t-test, test of Hypotheses and significance, degree of freedom, Z-test, small and large sampling, Introduction to Monte Carlo method.

TEXT BOOKS:

I. Advanced Engineering Mathematics: H.K. Doss; S. Chand & Co., 9 Revised Edition, 2001.
2. Discrete Mathematics: S.K. Sarkar; S. Chand & Co., 2000.
3. Numerical Analysis: S.S. Sastry; Prentice Hall of India, 1998.
4. Mathematical Statistics: J.N. Kapoor and H.C. Saxena.
5. Mathematical Statistics: M. Ray and H. Sharma

Name and Signatures	**Departmental members**
V.C. Nominee	1. **HOD- Mr. Dileep Kumar Sahu**.....
Subject Expert	2. **Mrs. Latika Tamrakar** .....
Subject Expert.....	3. **Dr. Sanat Kumar Sahu**.....
Alumni(member).....	
Prof. from other Dept. of Sc. Faculty	
Specialist from Industry	

GOVT. V.Y.T. P.G. AUTO. COLLEGE, DURG (C.G.)
SYLLABUS FOR AY 2023-24
BCA – PART III
SUBJECT CODE: BCA -302
PROGRAMMING IN PYTHON

Max Marks: 80 **Min Marks: 27**

Note: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculators allowed not scientific calculator.

Course Objective:Covers software design, implementation, and testing using Python Introduces object-oriented design techniques and problem solving. Emphasizes on Data handling and Data Visualization using Python Libraries.

Course Outcome:Attheendof this course,Studentwillableto:

- Define the Structure and Components of a Python Program.
- Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements
- Interpret the concepts of Object-Oriented Programming as used in Python.
- Discover the commonly used libraries for data handling.
- Demonstrate data handling concepts and provide data visualization using Python matplotlib.

UNIT - I

Introduction to Python Programming Language, IDLE, Installing Python, basic syntax, interactive shell and script mode, editing saving and running a script; Variables, keywords, mutable and immutable data types, Operators in Python, and expressions; input and output statements, comments in the program, understanding error messages.

UNIT-II

Lists, Tuples and Dictionaries and Control statements

Control Statements (Branching: if-else, Nested if-else, Looping, Conditional Statement, Exit function, Difference between break, continue and pass). Lists, Tuples Dictionaries and String Operation.

UNIT - III

Introducing Classes and Objects: Class Fundamentals, Declaring Object, Constructors, Defining Methods, method overloading, Inheritance: Inheritance basic and types, Member accessibility modifier: public, protected, private.

Python Exceptions Handling: Exception Basics, Handling an exception, try….except…else, try-finally clause

UNIT—IV

Data Handling using The Numerical Python Library (NumPy) and File Operations

Python packages, Introduction to PIP, Installing Packages via PIP, Introduction to NumPy library, NumPy arrays and their advantage, NumPy Attributes and Mathemetical, Binary and String Functions, creation of NumPy arrays; from lists using np.array(), np.zeros(), np.ones(),np.arange() , basic slicing and indexing ; concatenating and splitting array; Arithmetic operations on one dimensional and two dimensional arrays. Calculating max, min, count, sum, mean, median, mode, standard deviation on NumPy arrays.

Python File Operations: Reading files, Writing files in python, Understanding read functions, read(), readline(), readlines(). Understanding write functions, write() and writelines()

UNIT-V

Data Handling using Pandas and Data Visualization using Matplotlib

Data Handling using Pandas - Introduction to Python libraries- Pandas, Matplotlib.
Data structures in Pandas - Overview of Series and DataFrames,
Reading data from csv file Importing/Exporting Data between CSV files and Data Frames.
Data Visualization Matplotlib- Purpose of plotting, drawing and saving of different basic Matplotlib charts (line plot, bar graph, histogram). Basic customization of plots: adding label, title, and legend in plots.

BOOKS RECOMMENDED:

1. PYTHON COMPLETE REFERENCE - BY ATRICKNAUGHTEN&MESUTSCPDDT. [TMH]
2. Python Programming Anurag Gupta, G P Biswas Mc Graw Hill
3. Complete Reference Python Martin C. Brown Mc Graw
4. Python for beginners Harsh Bhasin

Name and Signatures

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Subject Expert.....	2. **Mrs. Latika Tamrakar** .....
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Prof. from other Dept. of Sc. Faculty.....	
Specialist from Industry	

GOVT. V.Y.T. P.G. AUTO. COLLEGE, DURG (C.G.)

SYLLABUS FOR: (2023-24)
BCA – PART III
SUBJECT CODE: BCA -303
DOT NET TECHNOLOGY

Max Marks: 80 **Min Marks : 27**

Note: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculators allowed not scientific calculator.

Course Objective:

- **Understand** code solutions and compile VB.Net projects within the .NET framework.
- **Design** and **develop** professional console and window based .NET application
- **Demonstrate** knowledge of object-oriented concepts Design user experience and functional requirementsVB.NET application.
- **Construct** classes, methods, and assessors, and instantiate objects.

Course Outcome: Attheendof this course,Studentwillableto:

- **Create** and **manipulate** GUI components in VB.
- **Design** and **Implement** Windows Applications using Windows Forms, Control Library, Advanced UI Programming & Data Binding concepts
- **Design** and **Implement** database connectivity using ADO.NET in window based application.
- **Identify** and resolve problems (debug /trouble shoot) in VB.NET window based application
- **Identify** Industry defined problem and suggesting solution(s) using .NET application.

UNIT-I Inside the .Net Framework

Overview of .Net framework, Features of .Net, CLR, Common Language Specification, !IT compilation, MSIL, Namespace, FCL, Assemblies, Common Type System, Cross Language, lnteroperability, Garbage Collection.

UNIT- II Programming with VB.Net

Data types, Variables, Constant, Type Conversions, Operators, Control Structure : Conditional Statement, loops(do loop, for loop, while loop, for Each...Next loop), arrays, Declaring arrays and dynamic arrays, Types, Structure, Enumeration, Sub Procedure, Functions.

Unit- III Windows Form:

Windows Form: Working with visual Studio IDE, Creating a .Net Solution, simple forms, MDI forms, windows forms: Control class, TextBox, Richtextboxes, Labels, Button, Checkbox, Radio Button, Panels, Group box, Listbox , Checked list box, Combobox , Picture box, Scrollbar, Timer, Trackbar, Progress bar. Msgbox Function, Message Box. Show Method, Input Box function, Creating MDI application. Menus, creating Menu, sub menu Items, Context Menu.

Unit- IV OOPS concept

Class and objects, creating classes, objects, creating data member, creating class shared data member, shared methods, shared properties, overloading methods and properties, with statement, constructor, Destructor(using finalize method), Inheritance, overriding base class member, inheriting constructor, overloading base class member.

Unit- V Database Programming

Database concept, Ado.net Architecture, .Net Data Provider(Connection class: OledbConnection,SqIConnection, Command class : SqICommand class, OleDbCommand class, DataAdapter class, DataReader class), Dataset Component, Creating Database application using windows forms(DB connectivity through ADO.Net), accessing data from database, navigate in data, working with Data Grid.

BOOKS RECOMENDED:

- MSDN online — By Microsoft.
- Visual Basic .NET Complete — BPB Publications, New Delhi.
- The Complete Reference VB. NET — Jeffery R. Shapiro, Tata McGraw Hill.
- Visual Basic .NET Programming Black Book — Steven Holzner by Dreamtech Press.

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GOVT. V.Y.T. P.G. AUTO. COLLEGE, DURG (C.G.)
SYLLABUS FOR: (2023-24)
BCA – PART III
SUBJECT CODE: BCA -304
SOFTWARE ENGINEERING

Max Marks: 80 **Min Marks: 27**

Note: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculators allowed not scientific calculator.

Course Objective:

- Be employed in industry, government, or entrepreneurial endeavors to demonstrate professional advancement through significant technical achievements and expanded leadership responsibility;
- Demonstrate the ability to work effectively as a team member and/or leader in an ever-changing professional environment; and
- Progress through advanced degree or certificate programs in computing, science, engineering, business, and other professionally related fields.

Course Outcome: Attheendof this course,Studentwillableto:

- Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- Understand the various process models.
- An ability to communicate effectively with a range of audiences.
- Be able to design software by applying the software engineering principles.
- Understand the concept of software requirement specification.

UNIT — I

Software Engineering Fundamentals: Definition of software product; software development paradigms; software engineering; knowledge engineering and end user development approaches. Software Analysis:
Abstraction; partitioning and projection; system specification; software requirements specification (SRS) standards; formal specification method; specification tools; flow based, data based and object orientated analysis.

UNIT - II

Systems Design: Idealised and constrained design; process oriented design (cane and Sarsonand Yourdon notations); data oriented design (Wamier — (Orr, E-r modeling); Object oriented design (Booth approach); Cohesion and coupling; Design metrics; design documentation standards.

UNIT - III

Role of Case Tools: Relevance of case tools; High-end and low—end case tools; Automatedsupport for data dictionaries, data flow diagrams, entity relationship diagrams. Coding **And Programming:** Choice of programming languages; mixed language programming and call semantics; Re-engineering legacy systems; coding standard.

UNIT - IV

Software Quality And Testing: Software quality assurance; types of software testing (white box, black box, unit, integration, validation, system etc); debugging and reliability analysis; program complexity analysis; software quality and metrics; software maturity model and extensions. Software cost and Time estimation. Functions points; issues in software cost estimation; introduction to the Rayleigh curve3; alglorithmic cost model (COCOMO, Putnam-slim, Watson and feliix).

UNIT - V

Software Project Management: Planning software projects; work background structures; integrating software, software design and project planning; software project teams; project monitoring and controls.

RECOMENDED BOOKS:

I. Software Engineering: A Practitioner's Approach — by Essman Roger, Tata McGraw Hill

2. An Integrated approach to Software Engineering — by JalotePankaj, Narosa: New Delhi.

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GOVT. V.Y.T. P.G. AUTO. COLLEGE, DURG (C.G.)
SYLLABUS FOR: (2023-24)

BCA – PART III

SUBJECT CODE: BCA -305

DATA STRUCTURE

Max Marks: 80 **Min Marks: 27**

Note: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculators allowed not scientific calculator.

Course Objective:

- Analyze the asymptotic performance of algorithms.
- Write rigorous correctness proofs for algorithms.
- Demonstrate a familiarity with major algorithms and data structures.
- Apply important algorithmic design paradigms and methods of analysis.
- Synthesize efficient algorithms in common engineering design situations.

Course Outcome: At the end of this course, Student will able to:

- Make appropriate data structure and algorithm design decisions with respect to program size, execution speed and storage efficiency.
- Know common data structures(such as array, static array, dynamic array, pointers)
- Know common data structures (such as linked list, stacks, queues, priority queues, associative containers.
- Calculate the complexities of algorithms' of tree.
- Write an implement various sorting, searching and hashing problems.

UNIT — I INTRODUCTION —
Introduction, Basic terminology, Elementary data organization, Data structure, Data structure operation, Algorithms: complexity, time-space Tradeoff. Mathematical Notation and functions, Algorithmic Notation

UNIT — IICONCEPT OF ARRAYS, RECORDS AND POINTERS —
Basic Terminology, Linear Array; Single Dimensional Array, Multidimensional Array, Static Array, Dynamic Array; **Pointers:** Introduction of Pointer, **Records:** Record Structures.

UNIT — IIILINKED LISTS, STACKS, QUEUES, RECURSION —
Link lists, Traversing a linked list, searching a linked list; Insertion into a linked List, Deletion from a Linked List, Stacks, Array Representation of Stack; Queues.

UNIT—IVTREES -
Binary Trees, Representing Binary Trees in Memory, Traversing binary tree, Traversal Algorithms using stacks, header nodes; threads, Binary Search Tree, Searching and Inserting in Binary Search Tree, Deleting in Binary Search tree

UNIT – VSORTING AND SEARCHING —
Sorting: Bubble Sort, Quick Sort, Insertion Sort, Selection Sort, Merge Sort; **Searching:** Liner Search, Binary Search, Searching and data modification, Introduction to hashing.

BOOKS RECOMMENDED:

I. Data Structure - **Seymour Lipschutz (Schaum's Series).**
2. Data Structure & Program Design - **Robert L. Kruse, 3" Ed., Prentice Hall.**

GOVT. V.Y.T. P.G. AUTO. COLLEGE, DURG (C.G.)
SYLLABUS FOR: (2023-24)
BCA – PART III
SUBJECT CODE: BCA -306
COMPUTER SYSTEM ARCHITECTURE

Max Marks: 80 **Min Marks: 27**

Note: The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculators allowed not scientific calculator.

Course Objective:

- To understand the structure, function and characteristics of computer systems.
- To understand the design of the various functional units and components of computers.
- To identify the elements of modern instructions sets and their impact on processor design.

Course Outcome: At the end of this course, Student will able to:

- Describe the fundamental organization of a computer system and number systems.
- Explain the Boolean algebra with simplification methods and various types of logic circuits.
- Explain fundamental functions of CPU Organization.
- Describe basic concept of Input-output organization.
- Distinguish the organization of various parts of a system memory hierarchy and memory management system.

UNIT I

Data Representation — Data Types, Number System, Fixed Point Representation — I 's, 2's complements, Binary Fixed point representation, Arithmetic operation on Binary operation, Overflow & Underflow, Codes, ASCII, EBCDIC codes, Grey codes, Excess-3, BCD codes, Error detection & correcting codes.

UNIT II

Digital Logic Circuits — Logic Gates AND, OR, NOT, Gates & their truth tables, NOR, NAND & XOR Gates, Boolean algebra, Basic Boolean Law, Demorgan's theorem, Map Simplification, Minimizing technique, K Map, Sum of products, Product of sums, Combinational & sequential Circuits Half adder & Full adder, Full Subtractor, Flip Flop — RS, D, JK & T Flip Flop, Shift register, RAM & ROM.

UNIT III

CPU organization, ALU & control circuit, Idea about arithmetic circuits, Program control, Instruction sequencing, Introduction to Microprocessor, System buses, Registers, Program counter, Block diagram of a Macro computer system, Microprocessor control signals, Interfacing Devices, Introduction to Motherboard, SMPS.

UNIT IV

Input output organization, I/O Interface, Properties of simple I/O devices and their Controller, Isolated versus Memory mapped I/O, Modes of Data transfer, Synchronous & Asynchronous Data Transfer, Handshaking, Asynchronous serial transfer, I/O processor.**UNIT V**

Auxiliary memory - Magnetic drum, Disk & Tape, Semi conductor memories, Memory Hierarchy, Associative memory, Virtual memory, address space & memory space, Address mapping, Page table, Page replacement, cache memory, Hit ratio, Mapping Techniques, Writing into cache.

BOOKS RECOMMENDED :

1. Computer System architecture— M. Moris Mano
2. Computer Architecture and Organization — Nicholas P Carter, Schaum's Outlines
3. Computer Organization and Architecture — William Stallings

GOVT. V.Y.T. P.G. AUTO. COLLEGE, DURG (C.G.)
SYLLABUS FOR: (2023-24)
BCA – PART III
SUBJECT CODE: BCA -307
LAB VII: PROGRAMMING LAB IN PYTHON

Course Objective: This course intends to provide in-depthprogramming knowledge of programming with Python and project development.

Course Outcome:**On successful completion of the course, thestudent will be able to:**
CO1: Know basics of f python to write Programs.
CO2: Write program to handle String and List.
CO3: Implement program related to tuples and dictionary.
CO4: Design program related to objects and classes.
CO5: Design good data handling program in Pandas.

1. Scheme of Examination:-Practical examination will be of 3 hours duration. The distribution ofpractical marks will be as follows:

Programme 1	-	**20**
Programme 2	-	**20**
Programme 3	-	**20**
Viva	-	**20**
[Practical Copy + Internal Record]	-	**20**
Total		**– 100**

2. In every program there should be comment for each coded line or block of code
3. Practical file should contain printed programs with name of author, date, path of program, unit no. and printed output.
4. All the following programs or a similar type of programs should be prepared

List of Practical

1. Python basic, Data types, Typecasting, Data type conversions, String operations, Slicing, Stride, String Methods. Python programming fundamentals-conditions & Branching
1. Input a welcome message and display it.
2. Input two numbers and display the larger / smaller number.
3. Input three numbers and display the largest / smallest number.
4. Determine whether a number is a perfect number, an Armstrong number or a palindrome.
5. Input a number and check if the number is a prime or composite number.
6. Count and display the number of vowels, consonants, uppercase, lowercase characters in string.
7. Input a string and determine whether it is a palindrome or not; convert the case of characters in a string.

2. Tuple, Lists, Set, Dictionaries- Tuple indexing, Slicing, Nesting, List indexing, List functions-extend, append, delete, split. List Aliasing, List Clone. Set –creating set, Set Operations.
Dictionaries.

1. Find the largest/smallest number in a list/tuple
2. Input a list of numbers and swap elements at the even location with the elements at the odd location.
3. Input a list/tuple of elements, search for a given element in the list/tuple.
4. Input a list of numbers and test if a number is equal to the sum of the cubes of its digits. Find the smallest and largest such number from the given list of numbers.
5. Create a dictionary with the roll number, name and marks of n students in a class and display thenames of students who have marks above 75.
6. To print the highest and lowest values in the dictionary

3. Objects and classes, working with Data in Python-Reading files, writing files, Copying file.

1. Read a text file line by line and display each word separated by #. Read a text file and display thenumber of vowels/ consonants/ uppercase/ lowercase characters in the file.
2. Create a binary file with name and roll number. Search for a given roll number and display the name, ifnot found display appropriate message.
3. Create a binary file with roll number, name and marks. Input a roll number and update the marks.
4. Remove all the lines that contain the character `a' in a file and write it to another file.

4 Data Handling with Pandas

1. Create a panda's series from a dictionary of values and array
2. Given a Series, print all the elements that are above the 75th percentile.
3. Create Data Frame quarterly sales where each row contains the item category, item name, and expenditure. Group the rows by the category and print the total expenditure per category.
4. Create a data frame for examination result and display row labels, column labels data types of each column and the dimensions
5. Filter out rows based on different criteria such as duplicate rows. 6. Importing and exporting data between pandas and CSV file.

Note: List of experiments may be changed by the concerned teacher.

Name and Signatures

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GOVT. V.Y.T. P.G. AUTO. COLLEGE, DURG (C.G.)
SYLLABUS FOR: (2023-24)
BCA – PART III
SUBJECT CODE: BCA -308
PRACTICAL LAB VIII: DOT NET TECHNOLOGY LAB

Course Objective

- **Understand** code solutions and compile VBprojects within the .NET framework.
- **Design** and **develop** professional console and window based .NET application
- **Demonstrate** knowledge of object-oriented concepts Design user experience and functional requirements C#.NET application.
- **Construct** classes, methods, and assessors, and instantiate objects.

Course Outcome

- **Create** and **manipulate** GUI components in C#.
- **Design** and **Implement** Windows Applications using Windows Forms, Control Library, Advanced UI Programming & Data Binding concepts
- **Design** and **Implement** database connectivity using ADO.NET in window based application.
- **Identify** and resolve problems (debug /trouble shoot) in C#.NET window based application
- **Identify** Industry defined problem and suggesting solution(s) using .NET application.

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1. Scheme of Examination:-Practical examination will be of 3 hours duration. The distribution of practical marks will be as follows:

Programme 1	-	**20**
Programme 2	-	**20**
Programme 3	-	**20**
Viva	-	**20**
[Practical Copy + Internal Record]	-	**20**
Total		**– 100**

List of Programs:

1. Write a program to find maximum between three numbers.
2. Write a program to check whether a number is negative, positive or zero.
3. Write a program to check whether a year is leap year or not.
4. Write a program to check whether a character is alphabet or not.
5. Write a program to find all roots of a quadratic equation
6. Design an application to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer. Calculate percentage and grade according to following:
   Percentage >= 90% : Grade A
   Percentage >= 80% : Grade B
   Percentage >= 70% : Grade C
   Percentage >= 60% : Grade D
   Percentage >= 40% : Grade E
   Percentage < 40% : Grade F

7. Design an application to input basic salary of an employee and calculate its Gross salary according to following:

   Basic Salary <= 10000: HRA = 20%, DA = 80%
   Basic Salary a 20000: HRA = 25%, DA = 90%
   Basic Salary > 20000: HRA = 30%, DA = 95%

8. Design an application to input electricity unit charges and calculate total electricity bill according to the given condition:

   For first 50 units Rs. 0.50/unit
   For next 100 units Rs. 0.75/unit
   For next 100 units Rs. 1.20/unit
   For unit above 250 Rs. 1.50/unit
   An additional surcharge of 20% is added to the bill

9. Write a program to convert decimal to binary number system using bitwise operator.
10. Write a program to swap two numbers using bitwise operator
11. Write a program to create Simple Calculator using select case.
12. Write a program to find sum of all natural numbers between 1 to n

.

13. Write a program to find first and last digit of any number 1
14. Write a program to enter any number and print its reverse.
15. Write a program to enter any number and check whether the number is palindrome or not.
16. Write a program to check whether a number is Armstrong number or not.
17. Write a program to print Fibonacci series up to n terms.
18. Write a program to print Pascal triangle upto n rows.
19. Write a program to print all negative elements in an array.
20. Design a digital clock using timer control.

21. Design an application that accepts the item name from the user and add it to a listbox and combobox.

22. Create an application that offers various food items to select from check boxes and a mode of payment using radio button. It then display the total amount payable.

23. Create an application to implement the working of Context menu on textbox.

24. WAP to illustrate all functionalities of listbox and combobox.

25. WAP using checknoxes for the following font effects.

   Bold
   Italic
   Underline
   Increase Font size
   Decrease Font size
   Font Color

26. WAP for temperature conversion using radiobutton
27. WAP to launch a rocket using Picturebox and Timer control.
28. WAP to change the back color of any control using scrollbox.
29. WAP to search an element for one dimensional array.

29. Design a menu such that it contain submenu such as Addition, Subtraction, Scalar Multiplication, Multiplication, Transpose of two metrics.
30. WAP to find greatest among three given number using user define procedures.
31. WAP to calculate factorial of a number using user define procedure.
32. WAP to check whether given number is neon or not using user define function.
33. WAP to check whether a given number is Niven or not using procedure.
34. WAP to check whether a given number is duck number or not.
35. WAP to check whether a given number is spy number or not.
36. WAP to check whether a given number.

37. Design the following application using radio button and checkbox:Design an application to Create

the Payroll form shown below. Number of hours must be entered as well as the appropriate rate.

Gross salary = rate " hours.
Net salary = gross salary - deductions.

38. Develop an application which is similar to notepad using menus.
39. Develop an application for facilitating purchasing order.

40. Develop an application for billing system in coffee shop

41. Develop an application which is similar to login formDefine a Class 'ACCOUNT' include following Data members: Name of depositor, Account no, type of Account, balance amount. Member Functions: To Deposit an amount, to withdraw an amount after checking balance, to show balance. Also provide proper validations wherever necessary. Write a main program to test above class.

42. Develop a project which displays the student information in the relevant fields from the database which already exists.
43. Define structure student. Structure student has data members for storing name, rollno, name of three subjects and marks. Write member function to store and print data.

44. Write a class having name Calculate that uses static overloaded function to calculate area of circle, area of rectangle and area of triangle.

45. Create a class account that stores customer name, account number and type of account. From this derive the classes cur_acct and sav_acct to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks:
a) Accept deposit from customer.
b) Display the balance
c) Computer and deposit interest.
d) Permit withdrawal and update the balance.
e) Check for the minimum balance, impose penalty, necessary and update the balance.

48. Create a class circle with data member radius; provide member function to calculate area. Derive a class sphere from class circle; provide member function to calculate volume. Derive class cylinder from class sphere with additional data member for height and member function to calculate volume.

49. Consider an example of declaring the examination result. Design three classes:- student, exam and result. The student class has data members such as that representing roll number, name of student. Create the class exam, which contains data members representing name of subject, minimum marks, maximum marks, obtained marks for three subjects. Derive class result from both student and exam classes. Test the result class in main function.

50 WAP that implements the Concept of Encapsulation.
51. WAP to demonstrate concept of Polymorphism (function Overloading and constructor Overloading).

52. Create a class Student having data members to store roll number, name of student, name of three subjects, max marks, min marks, obtained marks. Declare an object of class student. Provide facilities to input data in data members and display result of student.

53. Create a class Student having data members to store roll number, name of student, name of three subjects, max marks, min marks, obtained marks. Declare array of object to hold data of 3 students. Provide facilities to display result of all students. Provide also facility to display result of specific student whose roll number is given.

54. Create a class array having an array of integers having 5 elements as data member provide following facilities:
    a) Constructor to get number in array elements.
    b) Sort the elements.
    c) Find largest element
    d) Search for presence of particular value in array element.

55. WAP to display records of a table using data dapter and code for buttons to move at first record, next record, previous record, last record in the table.

56. Create a table for employee and write a program using Dataset to add, delete, edit & navigate records.
57. WAP to access a database using ADO.net& display a key column in the combo box or list box when an item is selected in it, its corresponding records is shown in Datagridcontrol.

Name and Signatures

V.C. Nominee	**Departmental members**
Subject Expert	1. **~~HOD-Mr. Durgesh Kumar Kotangle~~** .....
Subject Expert.....	2. **Mr. Dileep Kumar Sahu** .....
Alumni(member).....	3. **Mrs. LatikaTamrakar** .....
Prof. from other Dept. of Sc. Faculty	Dr. Sanat Kr. Sahu
Specialist from Industry	

GOVT. V.Y.T. P.G. AUTO. COLLEGE, DURG (C.G.)
SYLLABUS FOR: (2023-24)
BCA – PART III
SUBJECT CODE: BCA -309
LAB IX: PROJECT

1. Scheme of Examination: The Project should be done by individual student. Practical Examination will be of 3 hours duration. The distribution of practical marks is as follows:

Software Demonstration -	40
Project Report (Hard Copy + Soft Copy) -	20
Project Demonstration/Presentation -	20
Project Viva -	20
Total - 100	

2. Format of the student project report on completion of the project:

- Cover page as per format
- Certificate of Approval
- Certificate of project guide/Center Manager
- Certificate of Evaluation
- Declaration / Self certificate
- Acknowledgement
- Synopsis of the project
- Main Report
  - Objective & Scope of the project
  - Theoretical Background of Project
  - Definition of problem
  - System Analysis & Design
  - System Planning (PERT Chart)
  - Methodology adopted, system Implementation & details of Hardware & Software used
  - System maintenance & Evaluation
  - Cost and Benefit Analysis
  - Detailed Life Cycle of the project
    - _ ERD, DFD
    - _ Input and Output Screen Design
    - _ Process involved
    - _ Methodology used for testing
    - _ Test Report, Printout of the code sheet
  - User/Operational Manual – including security aspect, access rights, backup control etc.
  - Conclusion
  - References
  - Soft copy of the project on CD

Formats of various certificates and formatting styles are as:

1. Project report Cover Format:

A

Project Report

On

Title of the Project report

(Times New Roman, Italic , Font Size=24)

Submitted in partial fulfillment of the requirements for the award of degree

Bachelor of Computer Application

From

GOVT. V.Y.T. P.G. AUTONOMOUS COLLEGE, DURG (C.G.)

(Bookman Old Style, 16point, Center)

(Session -2023-24)

Guide
(Guide Name)

Submitted by:
(Student's Name)
Roll No.

Submitted to

Department of Computer Science
GOVT. V.Y.T. P.G. AUTONOMOUS COLLEGE, DURG (C.G.)
Affiliated to
Hemchand Yadav Vishwavidyalaya, Durg (C.G.)

2. Certificate of Approval by Head of Department in letter head

CERTIFICATE OF APPROVAL

This is to certify that the Project work entitled "----------" iscarried out Mr/Ms/Mrs---------- ----------. A student of BCA-III year at **(College Name)** ishereby approved as a credible work in the discipline of Computer Science and Application forthe award of degree of **Bachelor of Computer Application** during the year----------fromGovt. V.Y.T. P.G. Autonomous College, Durg (C.G.) affiliated toHemchand Yadav Vishwavidyalaya, Durg (C.G.).

(Head Name)

3. Certificate from the Guide in letter head

CERTIFICATE

This is to certify that the Project work entitled "_----------_"
Submitted to the (College Name) by Mr/Ms/Mrs----------Roll No ----------
----------in partial fulfillment for the requirements relating to nature and standard of award of Bachelorof Computer Application degree by, Govt. V.Y.T. P.G. Autonomous College, Durg (C.G.) affiliated toHemchand Yadav Vishwavidyalaya, Durg (C.G.) forthe academic year 2021-2022.

This project work has been carried out under my guidance.

(Guide Name)

4. Certificate of the company or Organisation from where the Project is done from the Project Manager or Project guide.

5. Certificate of evaluation in the department letter head

CERTIFICATE OF EVALUATION

This is to certify that the Project work entitled "_____" is carried outMr/Ms/Mrs _____, a student of BCA-III year at (College Name), after properevaluation and examination, is hereby approved as a credible work in the discipline ofComputer Science and Application and is done in a satisfactory manner for its acceptance as arequisite for the award of degree of Bachelor of Computer Application during theyear_____ from Govt. V.Y.T. P.G. Autonomous College, Durg (C.G.) affiliated toHemchand Yadav Vishwavidyalaya, Durg (C.G.)

Internal Examiner **External Examiner**

6. Declaration of Student/Self Certificate

DECLARATION

This is to certify that the Project work entitled "_____" ,which is submitted by me in partial fulfillment for the award of degree of Bachelor ofComputer Application, (College Name), comprises the original work carried out by me.

I further declare that the work reported in this project has not been submitted and willnot be submitted, either in part or in full for the award of any other degree or diploma in thisInstitute or any other Institute or University.

Place :
Date :

(Student Name)
(Roll No)

7. Acknowledgement

In the "Acknowledgement" page, the writer recognizes his/her indebtedness forguidance and assistance of the thesis/report adviser and other members of the faculty.Courtesy demands that he/she also recognize specific contributions by other persons orinstitutions such as libraries and research foundation. Acknowledgements should besimple, tastefully and tactfully.

Name and Signatures

V.C. Nominee	**Departmental members**
Subject Expert	1. **HOD- Mr. Dileep Kumar Sahu**.....
Subject Expert.....	2. **Mrs. Latika Tamrakar** .....
Alumni(member).....	3. **Dr. Sanat Kumar Sahu**.....
Prof. from other Dept. of Sc. Faculty	
Specialist from Industry	

DIRECTIVES FOR STUDENTS, FACULTY AND EXAMINERS

1. There shall be three sections (Section A, B, and C) in each theory paper.
2. Section A shall contain very short answer type questions (One or two line answer) or objective type questions (fill in the blank). **(not multiple choice questions)**
3. Section B shall contain short answer type questions with the limit of 150 words
4. Section C shall contain long answer/ descriptive type questions. The students are required to answer precisely and the answer should not exceed the limit of 350 words.
5. The students are required to study the content mentioned in the curriculum exhaustively.

EVALUATION PATTERN

- **Theory 50 marks**

Question Type	MM 50 (Marks X No. of Q.)
A (Very short Ans.)	1X10 = 10
B (Short Ans.)	3X5 = 15
C (Long Ans.)	5X5 = 25

- **Theory 80 marks , Practical 100 marks**

Question Type	MM 80 (Marks X No. of Q.)
A (Very short Ans.)	1X10 = 10
B (Short Ans.)	4X5 = 20
C (Long Ans.)	10X5 = 50

Name and Signatures

V.C. Nominee .....

Subject Expert .....

Subject Expert.....

Alumni(member).....

Prof. from other Dept. of Sc. Faculty .....

Specialist from Industry .....

Departmental members

1. **HOD: Mr. Dileep Kumar Sahu**.....
2. **Mrs. Latika Tamrakar**.....
3. **Dr. Sanat Kumar Sahu**.....

Corrigendum for UG Classes

1. **Section –A (very short answer question)**

   There shall be 8/9/10 objective type questions (No multiple choice). All questions are compulsory; at least one from each unit.

2. **Section B, Section C**

   There shall be 10 questions, two questions from each unit.

   The candidate has to attempt one question from each unit.

Name and Signatures

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Specialist from Industry	

BCA-III

SCHEME OF EXAMINATION 2023-24
BCA PART- III

Subject Code	Subject Paper	Theory Marks		Marks		Teaching Load per Week		
		Max. (A)	Min. (B)	Max. (C)	Min. (D)	L	T	P
BCA-301	Statistical Analysis	80	27	20	8	4	2	-
BCA-302	Programming in Python	80	27	20	8	4	2	-
BCA-303	Dot Net Technology	80	27	20	8	4	2	-
BCA-304	Software Engineering	80	27	20	8	4	2	-
BCA-305	Data Structure	80	27	20	8	4	2	-
BCA-306	Computer System Architecture	80	27	20	8	4	2	-
BCA-307	LAB VII: Programming Lab in Python	100	50	40	16	-	-	3x2
BCA-308	LAB VIII: Dot Net Technology Lab	100	50	40	16	-	-	2x2
BCA-309	LAB IX: Project	100	50	20	8	-	-	1x2
TOTAL		780	312	220	88			
GRAND TOTAL	(PAPER + INTERNAL)	(A+C) 1000		(B+D) 400				

NOTE: Student will have to pass individually in all theory, practical and sessional.

Name and Signatures

V.C. Nominee .....

Subject Expert .....

Subject Expert.....

Alumni(member).....

Prof. from other Dept. of Sc. Faculty .....

Specialist from Industry .....

Departmental members

1. HOD: Mr. Dileep Kumar Sahu..... 17/4/23
2. Mrs. Latika Tamrakar..... 17.4.23
3. Dr. Sanat Kumar Sahu..... 17/4/23

DEPARTMENT OF COMPUTER SCIENCE
GOVT. V.Y.T. PG. AUTONOMOUS COLLEGE DURG

Approved syllabus for BCA by the members of Board of Studies for the Session 2023-24

BCA PART-III:

PAPER I: (BCA- 301)	Statistical Analysis
PAPER II: (BCA- 302)	Programming in Python
PAPER III: (BCA- 303)	Dot Net Technology
PAPER IV: (BCA- 304)	Software Engineering
PAPER V: (BCA- 305)	Data Structure
PAPER VI: (BCA- 306)	Computer System Architecture
PRACTICAL VII: (BCA-307)	LAB VII: Programming Lab in Python
PRACTICAL VIII: (BCA- 308)	LAB VIII: Dot Net Technology Lab
PRACTICAL IX: (BCA- 309)	LAB IX: PROJECT

Name and Signatures

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