SVKP & Dr K S RAJU A & S COLLEGE (A) :: PENUGONDA
DEPARTMENT OF COMPUTER SCIENCE (BCA PROGRAMME)
2022-23
Bachelor of Computer Applications (BCA)

DETAILS OF COURSE STRUCTURE

S.No	Semester	Hours/ Week	No of Credits	Max.Marks	Max. Marks University Exam	Total Marks
				Internal assessment		
1	I	30	25	125	625	750
2	II	32	27	125	675	800
3	III	32	27	125	675	800
4	IV	36	30	150	750	900
5	V	36	30	150	750	900
6	VI					
TOTAL		**166**	**139**	**675**	**3475**	**4150**

Note: It is to be noted that, Basic Computer Applications under Life Skill Courses should not be opted by the student under any semester.

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I-Semester

S. No	Paper Code	Subject	Hours/ Week	No of Credits	Max. Marks	Max. Marks University Exam	Total Marks
					Internal assessment		
1.		English – I	4	3	25	75	100
2.		Language(H/T/S) – I	4	3	25	75	100
3.		Life Skill Course – I	2	2	-0-	50	50
4.		Skill Development Course – I	2	2	-0-	50	50
5.	22BCA 11	Computer Fundamentals & Office tools	4	4	25	75	100
	22BCA 11P	Computer Fundamentals & Office tools-Lab	2	1	-0-	50	50
6	22BCA 12	Programming in C	4	4	25	75	100
	22BCA 12P	Programming in C Lab	2	1	-0-	50	50
7.	22BCA 13	Numerical and Statistical Methods	4	4	25	75	100
	22BCA 13P	Numerical and Statistical Methods- Lab	2	1	-0-	50	50
Total			30	25	125	625	750

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II Semester

S.No	Paper Code	Subject	Hours/ Week	No of Credits	Max.Marks	Max. Marks University Exam	Total Marks
					Internal assessment		
1.		English – II	4	4	25	75	100
2.		Language(H/T/S) – II	4	3	25	75	100
3.		Life Skill Course – II	2	2	-0-	50	50
4.		Skill Development Course – II	2	2	-0-	50	50
5.		Skill Development Course – III	2	2	-0-	50	50
6.	22BCA21	Data Structures	4	4	25	75	100
	22BCA21P	Data Structures Lab	2	1	-0-	50	50
7.	22BCA22	Introduction to Python Programming	4	4	25	75	100
	22BCA22P	Introduction to Python Programming Lab	2	1	-0-	50	50
8.	22BCA23	Database Management Systems	4	4	25	75	100

	22BCA23P	Database Management Systems Lab	2	1	-0-	50	50
Total			32	28	125	675	800

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DETAILS OF COURSE-WISE SYLLABUS

	Course Code	Semester: I	Credits: 04
BCA	22BCA11	**Computer Fundamentals and Office Tools**	**Hrs/Wk:04**

Course Objectives:

- To introduce the concepts of computer fundamentals and their applications for the efficient use ofoffice technology in a business environment.
- To introduce the fundamentals of computing devices and reinforce computer vocabulary,particularly with respect to personal use of computer hardware and software.
- To provide hands-on use of Word, Excel and PowerPoint.

Course Outcomes:

- Describe the usage of computers and why computers are essential components in business andsociety.
- Identify categories of programs, system software and applications. Organize and work with filesand folders.
- Compose, format and edit a word document and working with macros.
- Create work sheets and using various functions.
- Make presentations and inserting multimedia in them.

UNIT – I:

Introduction: Characteristics of Computer, The evolution of Computers, The Computer Generations. **Basic Computer Organization:** Input Unit, Output Unit, Storage Unit, Arithmetic Logic Unit, Control Unit, Central Processing Unit.
Secondary Storage Devices: Magnetic Disk, Optical Disk. Magneto optical Disk, Mass StorageDevices, Flash Drive and Other related Concepts.

UNIT – II:

Computer Software: Types of Software, Logical systems Architecture, Acquiring Software, Software developmental Steps. **Computer Languages:** Machine Language, Assembly Language, High Level Language, Some High Level Languages, Characteristics of good Programming Language. **Number Systems:** Binary, Hexa Decimal, Conversion from one number system to another system.

UNIT –III:

MS-Word: Features of MS-Word, MS-Word Window components, working with formatted text, Shortcut keys, Formatting documents: Selecting text, Copying & moving data, Formatting characters, changing cases, Paragraph formatting, Indents, Drop Caps, Using format painter, Page formatting, Header & footer, Bullets & numbering, Tabs, Forming tables. Finding &replacing text, go to (F5) command, proofing text (Spell check, Auto correct), Reversing actions, Macros, Inserting pictures, Hyperlinks, Equation editor, Mail merging, Printing documents.

UNIT-IV:

MS-Excel: Excel Features, Spreadsheets, workbooks, creating, saving & editing a workbook, Renaming sheet, cell entries (numbers, labels, and formulas), find and replace, Adding and deleting rows and columns Filling series, fill with drag, data sort, Filters, Formatting worksheet, Functions and its parts, Some useful Functions in excel (SUM, AVERAGE, COUNT, MAX, MIN, IF), Cell referencing (Relative, Absolute, Mixed), What-if analysis Introduction to charts: types of charts, creation of charts, printing a chart, printing worksheet.

UNIT V:

MS-PowerPoint: Features of PowerPoint, Uses, components of slide, templates and wizards, using template, choosing an auto layout, using outlines, adding subheadings, editing text, formatting text, using master slide, adding slides, changing color scheme, changing background and shading, adding header and footer, adding clip arts and auto shapes. Various presentation, Working in slide sorter view (deleting, duplicating, rearranging slides), adding transition and animations to slide show, inserting music or sound on a slide, viewing slide show, Printing slides.

TEXT BOOKS:

1. Computer Fundamentals – Pradeep .K.Sinha: BPB Publications. Fundamentals of Computers -ReemaThareja, Oxford University Press India

REFERENCES:

1. Fundamentals of Computers – V. Rajaraman, Prentice Hall of India Introduction to Computers –Peter Norton Mcgraw Hill.

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BCA	Course Code	Semester: I	Credits: 01
	22BCA11**P**	**Computer Fundamentals and Office Tools Lab**	**Hrs/Wk:02**

List of Experiments:

1) Design a visiting card for managing director of a company as per the following specification.
   - Size of visiting card is 3 ½×2
   - Name of the company with big font
   - Phone number, Fax number and E-mail address with appropriate symbols.
   - Office and Residence address separated by a line
2) Create a table with following columns and display the result in separate cells for the following
   - Emp Name, Basic pay, DA, HRA, Total salary.
   - Sort all the employees in ascending order with the name as the key
   - Calculate the total salary of the employee
   - Calculate the Grand total salary of the employee
   - Find highest salary and
   - Find lowest salary
3) Prepare an advertisement to company requiring software professional with the following
   - Attractive page border
   - Design the name of the company using WordArt
   - Use at least one clipart.
   - Give details of the company (use bullets etc)
   - Give details of the Vacancies in each category of employee's (Business manager, Softwareengineers, System administrators, Programmers, Data entry operators) qualification required.
4) Create a letterhead of a company with the following specifications
   - Name of the company on the top of the page 2 with big font and good style
   - Phone no, Fax no and E-mail address with symbols.
   - Main products manufactured by the company
   - Slogans if any should be specify in bold at the bottom
5) Create two pages of curriculum vitae of a graduate with the following specifications
   - Table to show qualifications with proper headings
   - Appropriate left and right margins
   - Format ½ page using two-column approach about yourself
   - Name on each page at the top right side
   - Page no. in the footer on the right side.
6) Write a macro format document as below
   - Line spacing "2"(double)
   - Paragraph indent of 0.1

- Justification formatting style
- Arial font and Bold of 14pt-size

7) Create a letter as the main document and create 10 records for the 10 persons use mail mergeto create letter for selected persons among 10.
8) Create an electronic spread sheet in which you enter the following decimal numbers and convert theminto octal, Hexadecimal and binary numbers and vice-versa.

Decimal Numbers: 35,68,95,78,165,225,355,375,465

Binary Numbers: 101,1101,11101,11111,10001,11101111

9) Calculate the net pay of the employees following the conditions below.

	A	B	C	D	E	F	G	H	I
1	Employee Number	Employee name	Basic pay	DA	HRA	GPF	Gross pay	Income tax	Net pay
2									

DA: - 56% of the basic pay if Basic pay is greater than 20000 or else 44%.
HRA: - 15% of the Basic pay subject to maximum of Rs.4000.
GPF: - 10% of the basic pay.
INCOME TAX: - 10% of basic if Basic pay is greater than 20000. Find who is getting highest salary& who is get lowest salary?

10) The ABC Company shows the sales of different product For 5 years. Create BAR Graph,3D and Piechart for the following.

A	**B**	**C**	**D**	**E**	**F**
S.No.	Year	Pro 1	Pro 2	Pro 3	Pro 4
1	1989	1000	800	900	1000
2	1990	800	80	500	900
3	1991	1200	190	400	800
4	1992	400	200	300	1000
5	1993	1800	400	400	1200

11) Create a suitable examination database and find the sum of the marks (total) of each student andrespective, class secured by the student.

Pass: if marks in each subject >=35
Distinction: if average >=75

First class: if average >=60 but <75 **Second class:** if average >=50 but lessthan 60 **Third class:** if average>=35 but less than 50 **Fail:** if marks in anysubject <35

12) Enter the following data into the sheet.

Name	Department	Salary
Anusha	Accounts	12000
Rani	Engineering	24000
Lakshmi	Accounts	9000
Purnima	Marketing	20000
Bindu	Accounts	4500
Tejaswi	Accounts	11000
Swetha	Engineering	15000
Saroja	Marketing	45000
Sunitha	Accounts	5600
Sandhya	Engineering	24000
Harika	Marketing	8000

- Extract records for department in Accounts and Salary>10000
- Sort the data by salary with the department using "sortcommands".
- Calculate total salary for each department using Subtotals

13) Enter the following data into the sheet.

	Raju	Rani	Mark	Rosy	Ismail	Reshma
English	76	89	43	51	76	87
2nd Lang	55	85	78	61	47	33
Maths	65	82	34	58	52	65
Computers	45	91	56	72	49	56
Human Values	51	84	54	64	32	64

Apply the conditional formatting for marks

- 35 belowRed
- 35 to 50Blue
- 51 to 70Green
- 71 to 100 Yellow

14) Create a presentation using templates.
15) Create a Custom layout or Slide Master for professional presentation.
16) Create a presentation with slide transitions and animation effects.
17) Create a table in PPT and apply graphical representation Unit.

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BCA	Course Code	Semester: I	Credits: 04
	22BCA12	**Programming In C**	**Hrs/Wk:04**

Course Objectives:

- Provides knowledge on Algorithms, Flow chart and different programming languages.
- To train the students with basic concepts of programming using C.
- Provides complete knowledge of C language.
- Helps to develop logics which will help them to create program and applications in C.
- Learning the basic programming constructs, they can easily switch over to any other language infuture.

Course Outcomes:

Upon successful completion of this course, students will be able to-

- Understand the basic terminology used in computer programming.
- Write, compile and debug programs in C language.
- Use different data types in a computer program.
- Design programs involving decision structures, loops and functions.
- Understand the dynamics of memory by the use of pointers and Structures.
- Apply different operations in File handling.

UNIT - I:

Introduction to Algorithms and Programming Languages: Algorithm - Key features of Algorithms - examples of Algorithms, Flow Charts– Pseudo code, Programming Languages – Generation of Programming Languages – Structured Programming Language.

Introduction to C: Introduction – Structure of C Program, Writing the first C Program, File used in C Program – Compiling and Executing C Programs, Using Comments – Keywords – Identifiers, Basic Data Types in C, Variables – Constants, I/O Statements in C, Operators in C, Programming Examples, Type Conversion and Type Casting.

UNIT -II:

Control Structures and **Functions: Decision Control and Looping Statements:** Introduction to Decision Control Statements, Conditional Branching Statements, Iterative Statements, Nested Loops, Break and Continue Statement – Goto Statement.

UNIT - III:

Arrays and Strings: ***Arrays*****:** Introduction, Declaration of Arrays, Accessing elements of the Array – Storing Values in Array, Calculating the length of the Array, Operations that can be performed on Array, One dimensional array, Accessing one dimensional array, two dimensional Arrays, Accessing two dimensional arrays. ***Strings:*** Introduction, String Operations using String functions.

UNIT - IV:

Functions: Introduction, Using functions – Function declaration/ prototype – Function

definition, Function call – Return statement – Passing parameters, Passing one dimensional array to function, Scope of variables, Storage Classes, Recursive functions.

UNIT – V:

Pointers, Structures and Unions: ***Pointers:*** Understanding Computer Memory – Introduction to Pointers, Declaring Pointer Variable, Dynamic Memory Allocation, Drawbacks of Pointers. ***Structures***: Introduction to structures, Nested Structures. ***Union***: Introduction to Union – accessing union elements.

File Handling: ***Files*****:** Introduction to Files, Using Files in C, Reading Data from Files, Writing Data from Files.

PRESCRIBED TEXT BOOKS:

1. Computer Fundamentals and Programming in C by REEMA THAREJA from OXFORDUNIVERSITY PRESS

REFERENCE BOOKS:

1. E. Balagurusamy, COMPUTING FUNDAMENTALS &C PROGRAMMING – Tata McGraw-Hill,Second Reprint 2008, ISBN 978-0-07-066909-3.
2. Ashok N Kamthane: Programming with ANSI and Turbo C,Pearson Edition Publ, 2002.
3. Henry Mullish& Huubert L.Cooper: The Sprit of C, Jaico Pub, House,1996.
4. Teach your C Skills-Kanithker

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BCA	**Course Code**	**Semester: I**	**Credits: 01**
	22BCA12**P**	**Programming In C Lab**	**Hrs/Wk:02**

List of Experiments

1. Write a C program to convert hours into seconds.
2. Write a C program to check given number is even or odd
3. Write a C program to check given year is leap year or not.
4. Write a C program to check whether the given number is Prime or Not.
5. Write a C program to find the sum of individual digits of a given number.
6. Write a program to check whether given number is Palindrome or Not.
7. Write a C program to generate all the prime numbers between 1 and n, where n is avalue supplied by the user.
8. Write a C program to print the numbers in triangular form.

   1
   1 2
   1 2 3
   1 2 3 4
9. Program to display number of days in given month using Switch –Case.
10. Write a program to find given number in an array (linear search).
11. Write a C program to perform addition of two matrices.
12. Write a C program to determine if the given string is a palindrome or not.
13. Write a C program to find the factorial of a given integer using recursive function.
14. Write a C program to swap two numbers using Call by Value and Call by Reference.
15. Program to display Student Details using Structures.
16. Write a C program to
    i. Write data into a File.
    ii. Read data from a File.

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BCA	Course Code	Semester: I	Credits: 04
	22BCA13	**Numerical and Statistical Methods**	**Hrs/Wk:04**

Course Objectives:

- To learn how to perform error analysis for arithmetic operations.
- To demonstrate working of various numerical methods.
- To provide a basic understanding of the derivation and use of methods of interpolation andnumerical integration.
- To impart knowledge of various statistical techniques.
- To develop students understanding through laboratory activities to solve problems related toabove stated concepts.

Course Outcomes:

- Skill to choose and apply appropriate numerical methods to obtain appropriate solutions todifficult mathematical problems.
- Ability to apply various statistical techniques such as Measures of Central Tendency andDispersion.
- Understanding of relationship between variables using the method of Correlation and FitAnalysis.
- Skill to execute programs of various Numerical Methods and Statistical techniques for solvingmathematical problems.

UNIT - I:

Solution of equations (polynomial and transcendental equations) interval having methods, secant, Regula
– Falsi, Newton – Raphson methods, Fixed point Iteration method.

UNIT - II:

Solution of system of linear equations: Gauss – Elimination method, Gauss – Jordan, Gauss – Siedel iteration method, LU- Decomposition method, Eigen values and Eigen vectors of a square matrix.

UNIT - III*:*

Interpolation: Forward and backward differences, Newton's forward and backward formula, Lagrange's interpolation and Lagrange's inverse interpolation formula.
Numerical differentiation, integration: Numerical differentiation forward and backward formula, Trapezoidal and Simpsons formulas. *Statistical Methods:*

UNIT- IV*:*

Basic concepts and definition of statistics: Mean, Median, Mode , standard deviation, coefficient of variation ,skewness and kurtosis ,Karl Pearson Correlation coefficient ,Rank Correlation and illustrated examples .

UNIT V:

Probability : Basic concepts and definition of probability , Probability axioms , Conditional probability , Addition and Multiplication theorem of probability (Based on set theory concepts) , Bayes theorem , problems and applications .

TEXT BOOKS:

1) Sunil S .Patil Numerical and Statistical Methods EBPB.
2) S.S.Shastry Introductory methods of Numerical Analysis PHI (New Delhi).

REFERENCE BOOKS:

3) Gupta S.C & Kapuram VK Fundamentals of Mathematical Statistics.
4) Numerical Analysis, Sultan Chand & Sons New Delhi.

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BCA	Course Code	Semester: I	Credits: 01
	22BCA13**P**	**Numerical and Statistical Methods Lab**	**Hrs/Wk:02**

UNIT - I

1) Find the root of the Equation x x = 1.2 by using Regula - Falsi method.
2) Solve the Equation sin x = 5x – 2 by Iteration method.
3) Apply Newton - Raphson method , to find and approximate root , correct to three decimal places , of the Equation $x^3 - 3x - 5 = 0$, which lies near x = 2 .
4) Find the root of the Equation x sin x + cos x = 0 by using Newton – Raphson method.
5) Find the root of the Equation $x^3 + x - 1 = 0$ by Iteration method, given that a root lies near

UNIT - II

1) Solve the system of Equations 3x+y-z = 3 , 2x-8y+z=-5 , x-2y+9z=8 using Gauss – Elimination method.
2) Using Gauss –Jordan method solve the system, 2x+y+z=10, 3x+2y+3z = 18, x+4y+9z=16.
3) Solve the Equations 2x+3y+z=9, x+2y+3z=6, 3x+y+2z=8 by LU – Decomposition method.
4) Solve the system of Equations , 8x-3y+2z=20 , 4x+11y-z=33, 6x+3y+12z=35 by using Gauss- Seidel method.
5) Find the Eigen values & Eigen vectors of a square matrix A=$[8 - 62 - 67 - 42 - 43]$.

UNIT - III:

1) Using Newton's forward interpolation formula ,the given table of values ,

X	1.1	1.3	1.5	1.7	1.9
f(x)	0.21	0.69	1.25	1.89	2.61

Obtain the value of f(x) when x = 1.4

2) Using Lagrange's Interpolation formula , find the value of y , corresponding to x = 10

3) from the following table

X	5	6	9	11
Y	12	13	14	16

4) From the following table of values of x & y , obtain $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ for x = 1.5

X	1.5	2.0	2.5	3.0	3.5	4.0
Y	3.375	7.0	13.625	24.0	38.875	59.0

5) Evaluate $\int_0^1 x^3 dx$ with five sub-intervals by Trapezoidal rule.
6) Evaluate $\int_0^1 \frac{1}{1+x} dx$ using Simpson's 3/8 rule taking h = 1/6.

UNIT - IV

1) Find the Karl Pearson's coefficient of skewnwss for the following data :

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No.of students	10	12	18	25	16	14	8

2) Find Bowley's coefficient of skewness for the following data :

Salary	500-600	600-700	700-800	800-900	900-1000	1000-1100	1100-1200	1200-1300
No.of persons	10	28	40	64	25	18	9	6

3) Find the standard deviation from Assumed mean method for the following data :

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	1	4	17	45	26	5	2

4) Find the coefficient of skewness for the following data :

Variable	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	2	5	7	13	21	16	8	3

5) Find the rank correlation coefficient for the following data:

X 65	45	67	38	48	50	26	47	70	62
Y 64	40	58	46	52	49	38	47	59	60

UNIT - V

1) Three dice are tossed together. Find the probability that exactly two of the three numbers that show on them are equal.
2) What is the probability that a card drawn at random from the pack of playing cards may be either a Queen or a Jack?
3) If two cards are drawn from a well shuffled pack, find the probability that at least one of the two is Hearts.
4) A bag contains 4 Red, 6 Blue balls and a second bag contains 4 Blue & 6 Green balls. A ball is taken out from each bag. Find the probability that one ball is red and the other ball is Green. The probability that an event A happens in one trail of an experiment is 0.4. Three independent trails of the experiment are performed. Find the probability that the event A happens at least once

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BCA	Course Code	Semester: II	Credits: 04
	22BCA21	Data Structures	Hrs/Wk:04

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance of data structures in developing and implementing efficient algorithms. In addition, another objective of the course is to develop effective software engineering practice, emphasizing such principles as decomposition, procedural abstraction, and software reuse.

Course Outcomes:

After completing this course satisfactorily, a student will be able to:

1. Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented inmemory and used by algorithms.
2. Describe common applications for arrays, records, linked structures, stacks, queues, trees, andgraphs.
3. Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
4. Demonstrate different methods for traversing trees
5. Compare alternative implementations of data structures with respect to performance
6. Compare and contrast the benefits of dynamic and static data structures implementations
7. Describe the concept of recursion, give examples of its use, describe how it can be implementedusing a stack.
8. Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.

UNIT- I:

Concept of Abstract Data Types (ADTs)- Data Types, Data Structures, Primitive and Non-primitive DataStructures, Linear and Non-linear Structures.

Linear Lists - ADT, Array and Linked representations (Single and Double Linked lists), Pointers.

UNIT- II:

Stacks: Definition, Stacks using Array and Linked representations, expressions, notations. **Queues**: Definition, Queue using Array and Linked representations, Circular Queues, Dequeues.**UNIT- III:**

Trees: Binary Tree, Definition, Properties, Trees using Array and Linked representations,Implementations and Applications, Heaps Trees.

Binary Search Trees (BST) - Definition, Operations and Implementations. B Trees, B+ TreesImplementation

UNIT IV:

Graphs – Graph and its Representation, Graph Traversals, Connected Components, Basic SearchingTechniques, Minimal Spanning Trees.

UNIT- V:

Sorting and Searching: Selection, Insertion, Bubble, Merge, Quick, Sequential and Binary Searching.

REFERENCE BOOKS:

1. SamanthaD, Classic Data Structures, Prentice-Hall of India,2001
2. Sahani S, Data Structures, Algorithms and Applications in C++, McGraw-Hill,2002.
3. D S Malik, Data Structures Using C++, Thomson, India Edition 2006
4. Heilman G I,. Data Structures, Algorithms andObject-OrientedProgramming, Tata McGraw-l lill.2002. (Chapters I and14).
5. Tremblay .1 P, and Sorenson P G, Introduction to Data Structures and Applications, Tata McGraw-Hill,
6. Drozdek A, Data Structures and Algorithms in C++), 2nd edition, Vikas Publishing House,2002.
7. Kanetkar Y P, Data Structures through C ++, BPB Publications. 2003.
8. Data Structures by AllenWeiss

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BCA	Course Code	Semester: II	Credits: 01
	22BCA21**P**	**Data Structures Lab**	**Hrs/Wk:02**

List of Lab Experiments

1. Write Programs to implement the Stack operations using an array.
2. Write Programs to implement the Queue operations using an array.
3. Write Programs to implement the Stack operations using Linked lists.
4. Write Programs to implement the Queue operations using Linked lists.
5. Write a program for postfix expression evaluation.
6. Write a program to convert prefix to postfix.
7. Write a program for Binary search Tree Traversals
8. Write a program to implement dequeue using a doubly linked list.
9. Write a program to search an item in a given list using
    (i) LinearSearch
    (ii) BinarySearch.
10. Write a program for
    (i) BubbleSort
    (ii) Quick Sort
    (iii) Merge Sort.

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BCA	Course Code	Semester: II	Credits: 04
	22BCA22	**Introduction to Python Programming**	**Hrs/Wk:04**

Objective:

To introduce the student to the basic features of python programming and impart skills in an Industrystandard programming language

Outcomes: On the completion of this course, the student will be able to

- Understand the concepts of python programming
- Students should be able to develop logic for Problem Solving.
- Students should be able to apply the problem solving skills using syntactically simple language
- Create new GUI based programming to solve industry standard problems

UNIT-I:

Introduction to Python - Features of Python - Executing python program using command line window and IDLE graphics window, Python Virtual Machine - Identifiers - Reserved Keywords – Variables, Comments in Python – Input , Output and Import Functions - Operators – Data Types and Operations – int, float, complex, Strings, List, Tuple, Set, Dictionary - Mutable and Immutable Objects – Data Type Conversion, Illustrative programs

UNIT-II:

Decision Making -conditional (if), alternative (if-else), if..elif..else -nested if - Loops for, range(), while, break, continue, pass; **Functions, Arrays**- Fruitful functions- return values, parameters, local and global scope, function composition, recursion; **Strings:** string slices, immutability, string functions and methods, string module; Python arrays, Access the Elements of an Array, array methods.

UNIT-III:

LISTS, TUPLES, DICTIONARIES- Lists: List operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters, list comprehension; **Tuples:** Tuple assignment, tuple as return value, tuple comprehension; **Dictionaries**: operations and methods, comprehension;

UNIT-IV:

FILES, EXCEPTIONS, MODULES, PACKAGES- Built-in Modules - Creating Modules - Import statement - Locating modules - Namespaces and Scope - The dir() function - The reload function – Some useful Packages in Python (datetime, time, OS , calendar, math module)

Files and exception: text files, reading and writing files Renaming and Deleting files Exception handling exceptions, Exception with arguments, Raising an Exception - User defined Exceptions - Assertions in

UNIT-V:

GUI Programming- Introduction – Tkinter Widgets – Label – Message Widget – Entry Widget – Text Widget – tk Message Box – Button Widget – Radio Button- Check Button – List box Frames – Top level Widgets – Menu Widget

TEXT BOOKS:

1. "Taming PYTHON By Programming", Jeeva Jose Khanna Publications
2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist'", 2nd edition,

REFERENCE BOOKS:

1. Kenneth A. Lambert, "Fundamentals of Python: First Programs", CENGAGE Learning, 2012.
2. Learning Python, Mark Lutz, Orielly
3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson.

SVKP & Dr K S RAJU A & S COLLEGE (A) :: PENUGONDA
DEPARTMENT OF COMPUTER SCIENCE (BCA PROGRAMME)
2022-23

BCA	Course Code	Semester: II	Credits: 01
	22BCA22**P**	**Introduction to Python Programming Lab**	**Hrs/Wk:02**

List of Lab Experiments

1. Enter the number from the user and depending on whether the number is even or odd, print out anappropriate message to the user.
2. Write a program to generate the Fibonacci series.
3. Write a program that prints out all the elements of the given list list that are less than 5.
4. Write a program that takes two lists and returns True if they have at least one common member.
5. Write a Python program to clone or copy a list
6. Write a Python program to demonstrate arrays with list comprehension
7. Write a Python script to sort (ascending and descending) a dictionary by value.
8. Write a Python program to sum all the items in a dictionary
9. Write a program with a function that accepts a string and returns number of vowels, consonantsand special symbols in it.
10. Write a Python program to read an entire text file.
11. Write a Python program to append text to a file and display the text.
12. Write a program to implement exception handling.
    Write a GUI program that converts Celsius to foreign heat temperature using Widgets

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2022-23

BCA	Course Code	Semester: II	Credits: 04
	22BCA23	**Data Base Management System**	**Hrs/Wk:04**

Course Objective:

The objective of the course is to introduce the design and development of databases with specialemphasis on relational databases.

Course Learning Outcomes:

On completing the subject, students will be able to:

1. Gain knowledge of Database and DBMS.
2. Understand the fundamental concepts of DBMS with special emphasis on relational data model.
3. Demonstrate an understanding of normalization theory and apply such knowledge to thenormalization of a database
4. Model databaseusing ER Diagrams and design database schemas based on the model.
5. Create a small database using SQL.
6. Store, Retrieve data in database.

UNIT -I:

Overview of Database Management System: Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, database approach, Classification of Database Management Systems, advantages of database approach, Components of Database Management System, three schema architecture of database.

UNIT -II:

Data Models, Entity-Relationship Model: Introduction, the building blocks of ER model, classification of entity sets, attribute classification, relationship degree, relationship classification. Enhanced entity- relationship model (EER model), generalization and specialization, Inheritance - IS A relationship, constraints on specialization and generalization, advantages of EER modelling.

UNIT -III:

Relational Model: Introduction, CODD Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra, limitations of relational algebra. **Normalization:** Functional dependencies and normal forms upto 3NF.

UNIT -IV:

Structured Query Language: Introduction, History of SQL Standard, Commands in SQL (DDL, DML, DCL, TCL), Data Types in SQL, Aggregate functions, Join Operation, Set Operations, View, Sub Query.

UNIT -V:

PL/SQL: Introduction, Structure of PL/SQL, Data Types, Operators Precedence, Control Structure, Program, Iterative Control, Cursors, Procedure, Function, Database Triggers, Types of Triggers.

TEXT BOOKS:

1. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill
2. Database Management Systems by Raghu Ramakrishnan, McGrawhill
3. Principles of Database Systems by J. D. Ullman
4. Fundamentals of Database Systems by R. Elmasri and S. Navathe
5. SQL: The Ultimate Beginners Guide by Steve Tale.

REFERENCES BOOKS:

1. Database Principles, Programming, and Performance, P.O'Neil, E.O'Neil,2nd ed.,ELSEVIER.
2. Database Systems, A Practical approach to Design implementation and Management Fourthedition, Thomas Connolly, carolynBegg, Pearson education.
3. Database Systems Concepts, Peter Rob & Carlos Coronel, Cengage Learning, 2008.

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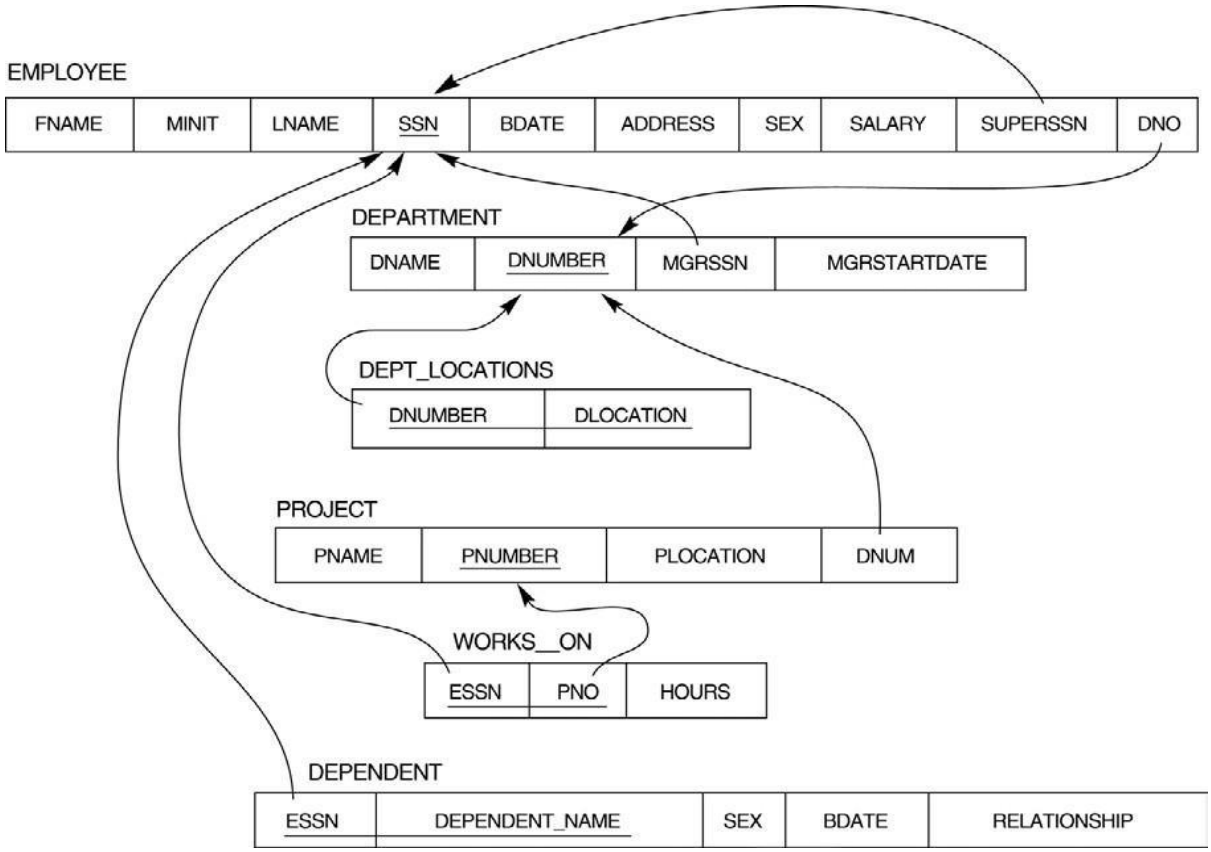
DEPARTMENT OF COMPUTER SCIENCE (BCA PROGRAMME)
2022-23

BCA	Course Code	Semester: II	Credits: 01
	22BCA23**P**	**Data Base Management System Lab**	**Hrs/Wk:02**

1. Draw ER diagram for hospital administration
2. Creation of college database and establish relationships between tables
3. Relational database schema of a company is given in the following figure.

Relational Database Schema - COMPANY



Questions to be performed on above schema

1. Create above tables with relevant ***Primary Key, Foreign Key and other constraints***

2. Populate the tables with data

3. Display all the details of all employees working in the company.

4. Display ssn, lname, fname, address of employees who work in department no 7.

5. Retrieve the Birthdate and Address of the employee whose name is 'Franklin T. Wong'
6. Retrieve the name and salary of every employee
7. Retrieve all distinct salary values
8. Retrieve all employee names whose address is in ‘Bellaire’
9. Retrieve all employees who were born during the 1950s
10. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
11. Retrieve the names of all employees who do not have supervisors
12. Retrieve SSN and department name for all employees
13. Retrieve the name and address of all employees who work for the 'Research' department
14. For every project located in 'Stafford', list the project number, the controlling departmentnumber, and the department manager's last name, address, and birth date.
15. For each employee, retrieve the employee's name, and the name of his or her immediatesupervisor.
16. Retrieve all combinations of Employee Name and Department Name
17. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan’ either as a worker or as a manager of the department that controls the project.
18. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.
19. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.
20. Select the names of employees whose salary does not match with salary of any employee in department 10.
21. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
22. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, andthe average salary. Display with proper headings.
23. Find the sum of the salaries and number of employees of all employees of the

‘Marketing’ department, as well as the maximum salary, the minimum salary, and the average salary in this department.

24. Select the names of employees whose salary is greater than the average salary of all employees in department 10.

25. Delete all dependents of employee whose ***ssn is ‘123456789’***.

26. Perform a query using alter command to drop/add field and a constraint in Employee table.