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KUVEMPU UNIVERSITY

SEP – 2024

CURRICULUM STRUCTURE AND SYLLABUS

Bachelor of Science (B.Sc) Programme
In
Computer Science

[According to SEP (State Education Policy): 2024]

w.e.f Academic Year 2024-25

Under Graduate Board of Studies

In

Computer Science and B.C.A.

Kuvempu University, Shankaraghatta,

Shimoga, Karnataka.

Curriculum Design / Syllabus Framing Committee

Sl. No.	Name	Designation
1.	**Dr. Prabhakar C J** Professor, Department of P.G Studies and Research in Computer Science, Kuvempu University, Shankaraghatta – 577541, Shimoga(D).	**Chairman**
2.	**Dr. Shoieb Ahamed** Assistant Professor, Department of Computer Science, Sir M V Government Science College – 577301, Bommanakatte, Bhadravathi, Shimoga(D).	**Member**
3.	**Mr. Shashidhara B** Assistant Professor, Department of Computer Science, IDSG Government College, Chikkamagaluru(D) – 577101,	**Member**
4.	**Mr. Gopala B** Assistant Professor, Department of Computer Science, Government First Grade College Shikaripura - 577427, Shimoga(D).	**Member**
5.	**Mr. Krishnamurthy K** Assistant Professor, Department of Computer Science, Government First Grade College, Thirthahalli - 577432, Shimoga(D).	**Member**
6.	**Mr. Prajwal Kumar P** Assistant Professor, Department of Computer Science, Government First Grade College, Kadur – 577548, Chikkamagaluru(D).	**Member**

The objectives of the B.Sc (CS) Program

1. The primary objective of this program is to provide a foundation of computing principles for effectively using information systems and enterprise softwares.
2. It helps students analyze the requirements for system programming and exposes students for information systems
3. This Programme provides students with options to specialize in various software system.
4. To produce outstanding Computer Scientists who can apply the theoretical knowledge into practice in the real world and develop standalone live projects themselves
5. To provide opportunity for the study of modern methods of information processing and its applications.
6. To develop among students the programming techniques and the problem- solving skills through programming
7. To prepare students who wish to go on to further studies in computer science and related subjects.
8. To acquaint students to Work effectively with a range of current, standard, Office Productivity software applications

Program Outcomes

1. **Discipline knowledge:** Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity
2. **Problem Solving:** Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
3. **Design and Development of Solutions:** Ability to design and development of algorithmic solutions to real world problems.
4. **Programming a computer:** Exhibiting strong skills required to program a computer for various issues and problems of day-to-day scientific applications.
5. **Application Systems Knowledge**: Possessing a minimum knowledge to practice existing computer application software.
6. **Communication:** Must have reasonably good communication knowledge both in oral and writing.
7. **Ethics on Profession, Environment and Society:** Exhibiting professional ethics to maintain the integrality in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
8. **Lifelong Learning:** Should become an independent learner. So, learn to learn ability.
9. **Motivation to take up Higher Studies:** Inspiration to continue educations towards advanced studies on Computer Science.

Bachelor of Science (B.Sc.) Computer Science - Semester Scheme

Curriculum Structure for Undergraduate Programme for 2025-26 as per SEP-2024

Three Majors with a General degree in all 6 Semesters

(Course Structure, Scheme of Teaching and Evaluation - 2024-25)

Curriculum Framework for UG Programmes as suggested by KSHEC, Government of Karnataka

(As per G.O. No.: ED 166 UNE 2023, Bengaluru, dated: 08-05-2024)

Allocation of credits in Kuvempu University for UG-Science programmes
Class I: Three Major Subjects combination in all Six Semesters

Sl.No.	Subject Category	No. of Credits
1	Major Courses	90
2	Languages	24
3	Compulsory	12
4	Electives/Optional	04
Total		**130**

Semester-wise allocation of credits in Kuvempu University for UG-Science programmes
(Three Subjects combination)

Year	Semester	Credits	Total Credits
1	I	23	**46**
	II	23	
2	III	25	**50**
	IV	25	
3	V	26	**34**
	VI	26	
Total		**148**	**130**

Semester-wise allocation of credits in Kuvempu University for B.Sc (CS) Programme for framing syllabus of One Major Subject in Three Major Subjects combination (Class - I stream)

Year	Semester	Credits	Total Credits
1	I	06	**12**
	II	06	
2	III	08	**16**
	IV	08	
3	V	10	**22**
	VI	12	
Total		**50**	**50**

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Bachelor of Science (B.Sc.) in Computer Science - Semester Scheme

Curriculum Structure for B.Sc. in Computer Science Programme for 2024-25

Sem	Course/ Paper Code	Title of the Paper	Subject Category	Teaching Hour/ week	Semester End Exam.	Internal Assessment	Total Marks	Credits	Examination Duration
1	2	3	4	5	6	7	8	9	10
Semester-I									
1	24MCS1	Computer Fundamentals and Programming in C	**MC-T**	04	80	20	**100**	04	3 Hrs.
	24MCS1P	Information Technology and C-Programming Lab	**MC-P**	04	40	10	**50**	02	3 Hrs.
	Total			**08**	**120**	**30**	**150**	**06**	---
Semester-II									
2	24MCS2	Data Structures Using C	**MC-T**	04	80	20	**100**	04	3 Hrs.
	24MCS2P	Data Structures Lab using C	**MC-P**	04	40	10	**50**	02	3 Hrs.
	Total			**08**	**120**	**30**	**150**	**06**	---
Semester-III									
3	24MCS3	Object Oriented Programming with Java	**MC-T**	04	80	20	**100**	04	3 Hrs.
	24MCS3P	JAVA Programming Lab	**MC-P**	04	40	10	**50**	02	3 Hrs.
	OPEN Elective I - Choose Any ONE (offered to other Programme)								
	24MCSE31	Office Automation	**EL**	03	40	10	**50**	02	2 Hrs.
	24MCSE32	Computer Fundamentals	**EL**	03	40	10	**50**	02	2 Hrs.
	Total			**11**	**160**	**40**	**200**	**08**	---
Semester-IV									
4	24MCS4	Database Management Systems	**MC-T**	04	80	20	**100**	04	3 Hrs.
	24MCS4P	DBMS Lab	**MC-P**	04	40	10	**50**	02	3 Hrs.
	OPEN Elective II - Choose Any ONE (offered to other Programme)								
	24MCSE41	Internet Basics	**EL**	03	40	10	**50**	02	2 Hrs.
	24MCSE42	E-Commerce	**EL**	03	40	10	**50**	02	2 Hrs.
	Total			**11**	**160**	**40**	**200**	**08**	---
Semester-V									
5	24MCS5	Web Technologies	**MC-T**	04	80	20	**100**	04	3 Hrs.
	24MCS6	Operating System	**MC-T**	04	80	20	**100**	04	3 Hrs.
	24MCS5P	Web Technologies Lab	**MC-P**	04	40	10	**50**	02	3 Hrs.
	Total			**12**	**200**	**50**	**250**	**10**	---
Semester-VI									
6	24MCS7	Artificial Intelligence and Machine Learning	**MC-T**	04	80	20	**100**	04	3 Hrs.

	24MCS8	Python Programming	**MC-T**	04	80	20	**100**	04	3 Hrs.
	24MCS7P	AI& ML Lab using Python	**MC-P**	04	40	10	**50**	02	3 Hrs.
	24MCSPRJ	Project	**PRJ**	04	40	10	**50**	02	3 Hrs.
	Total			**16**	**240**	**60**	**300**	**12**	---
	Grand total			**66**	**1000**	**260**	**1250**	**50**	**---**

Bachelor of Science (B.Sc.) in Computer Science - Semester Scheme

Curriculum Structure for Undergraduate Programme for 2024-25

Case 1 : Three Majors with a General degree in all Six Semesters – Number of courses and credit course-wise in all semesters

Semester	Major Course (Paper) Major 1	Elective/ Optional	AEDP
I	4+2 = **6**	---	
II	4+2 = **6**	---	
III	4+2 = **6**	Open Elective1- **2**	
IV	4+2 = **6**	Open Elective2- **2**	
V	4+4+2 = **10**	---	
VI	4+4+2 = **10**	---	Project - **2**
---	**---**	**---**	
Total	**44**	**04**	**02**
Grand Total		**50 Credits**	

1. Credit for the three major courses includes theory, practical (skill enhancement course), and tutorial/assignment/survey-based assignment/internship.
2. Practical paper(s) (Compulsory/Skill enhancement course) should provide practical experience which is complimentary to theory major paper(s).
3. Project Work/Dissertation/Internship/Apprenticeship Embedded Degree Programme (AEDP) should also be considered to be part of the curriculum.
4. **Project work/Dissertation/Internship during Semester-VI:** Students for Project work may be allotted as per following formula,

Project Allotment to Students

$$= \frac{\textit{Total number of students in a three subjects combination}}{\textit{Number of subjects in a combination (Three)}}$$

Theory - Continuous Assessment Programme/Internal Assessment

Sl. No.	Continuous Assessment Programme/Internal Assessment	Maximum Marks
01	Two Session Tests with proper record for assessment (5+5 = 10)	10
02	Assessment of Seminars/ Assignment with proper record	05
03	Attendance with proper record	05
	TOTAL MARKS	**20**

- **Attendance Marks-breakup**

<75% **=00 Marks** , 75-80% = **01 Mark** ,80-85% = **02 Marks** ,85-90% = **03 Marks**, 90-95%=**04 Marks,** 95% >=**05 Marks**

Practical Paper -Continuous Assessment Programme/Internal Assessment

Sl. No.	Continuous Assessment Programme/Internal Assessment	Maximum Marks
01	Attendance	05
02	Record/Journal	05
	TOTAL MARKS	**10**

Practical Examination

Sl. No.	Component	Maximum Marks
Experimentation (Major & Minor/Spotters)	Writing Part-A +Part-B	10+10 =20 Marks
	Execution	10 Marks
Viva voice	Viva voice	10 Marks
	Total	40 Marks

Project Work - Continuous Assessment Programme/Internal Assessment

Sl. No.	Continuous Assessment Programme/Internal Assessment	Maximum Marks
01	Project work/Dissertation/Internship and preparation of Report	5
02	Viva Voice / Presentation	5
	TOTAL MARKS	**10**

Project Work - Examination

Sl. No.	Component	Maximum Marks
01	Certificate/Dissertation/ Report	30
02	Viva Voice/Presentation	10
	TOTAL MARKS	**40**

B.Sc (CS) - I SEMESTER

Course Code: 24MCS1	Computer Fundamentals and Programming in C
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 20
Exam Duration: 03 Hours	Summative Exam Marks: 80

Course Outcomes (COs):

- Introduction to computers, classification of computers, anatomy of computer, constituents and architecture.
- Read, understand and trace the execution of programs written in C language
- Write the C code for a given problem
- Perform input and output operations using programs in C

Content	Hours
Unit - 1	
Introduction to Computers - Computer Definition, Characteristics, History of Computers, Anatomy of Computer -Central Processing Unit, Storage units, Input and output Devices. Types of Computers, Types of Software - System Software and Utility Software; Operating System, Computer Languages – Machine Level, Assembly Level & High-Level Languages, Translators - Assembler, Interpreter and Compiler.	13
Unit - 2	
Number Systems - Binary, Octal, decimal hexadecimal, convert binary to decimal, Decimal to binary, Decimal to hexadecimal, hexadecimal to decimal. Binary 1's complement, binary 2's complement. Computer Codes-BCD, Gray Code, ASCII and Unicode; Basic logic gates and operations. **Overview of C:** History and Features of C, Structure of a C Program with Examples, C Character Set. Header files - stdio, conio, maths, string, ctype. C tokens - keywords, identifiers, constants, and variables; Data types-int, float, char, double, long. Declaration & initialization of variables; Symbolic constants.	14
Unit - 3	
Input and output with C-Formatted I/O functions - printf and scanf, control stings and escape sequences. Unformatted I/O functions - getchar, putchar, gets and puts. **C Operators & Expressions** - Arithmetic operators, Relational operators, Logical operators, Assignment operators, Increment & Decrement operators, Bitwise operators, Conditional operator, Operator Precedence and Associativity, Evaluation of arithmetic expressions.	12
Unit - 4	
Control Structures - Simple if, if_else, nested if_else, Switch-case, goto, break & continue statements; Looping Statements - while, do-while, for loops. **Arrays** - Definition, Declaration, Initialization, Types of arrays, Representation of Linear Arrays in memory, Two-dimensional array, Operations on Array. **Pointers in C** - Understanding pointers - Declaring and initialising pointers, accessing address and value of variables using pointers, Advantages and disadvantages of using pointers.	13

Text Books

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
2. E. Balagurusamy: Programming in ANSI C (TMH)

References

1. Kamathane: Programming with ANSI and TURBO C (Pearson Education)
2. V. Rajaraman: Programming in C (PHI – EEE)
3. S. Byron Gottfried: Programming with C (TMH)
4. Kernighan & Ritche: The C Programming Language (PHI)
5. Yashwant Kanitkar: Let us C
6. P.B. Kottur: Programming in C (Sapna Book House)

Course Code: 24MCS1P	**Information Technology (IT) and C Programming LAB**
Course Credits: 02	**Hour of Teaching/Week: 04**
Total Contact Hours: 52	**Formative Assessment Marks: 10**
Exam Duration: 03	**Summative Exam Marks: 40**

Practice Lab

The following activities be carried out/ discussed in the lab during the initial period of the semester.

1. Basic Computer Proficiency
    a. Familiarization of Computer Hardware Parts
    b. Basic Computer Operations and Maintenance.
    c. Do's and Don'ts, Safety Guidelines in Computer Lab
2. Familiarization of Basic Software – Operating System, Word Processors, Internet Browsers, Integrated Development Environment (IDE) with Examples.

Part A:

1.Create Bio-data in word
2.Create timetable in word with text formatting
3.Create Content page with header and footer, including page number, date, title
4.Create PowerPoint Presentation with content animation
5.Create PowerPoint Presentation with Slide transition
6.Create student marks card in Excel
7.Create Bar Chart and Pie Chart in Excel for Stock market data
8.Create inventory Bill in Excel with formulas

Part B:

1.Write a C Program to swap two numbers
2.Write a C Program to check given number is odd or even
3.Write a C Program to Find Factorial of given number
4.Write a C Program to display Day of week using a switch case.
5.Write a C Program to generate N fibonacci numbers using a for loop.
6.Write a C Program to read a number, find the sum of the digits
7.Write a C Program to read three numbers and find the biggest of three
8.Write a C Program to Reverse the given number using do-while loop
9.Write a C Program to read, store and display N numbers using Array

B.Sc (CS) - II SEMESTER

Course Code: 24MCS2	Data Structures using C
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 20
Exam Duration: 03	Summative Exam Marks: 80

Course Outcomes (COs):

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

- Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
- Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs
- Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
- Demonstrate different methods for traversing trees
- Compare alternative implementations of data structures with respect to performance
- Describe the concept of recursion, give examples of its use
- Discuss the computational efficiency of the principal algorithms for sorting and searching

Course Content

Content	Hours
Unit - 1	
Introduction to data structures: Definition; Types of data structures - Primitive & Non-primitive, Linear and Non-linear; Operations on data structures. User Defined Functions - Need, Syntax. Recursive function - Definition, Examples - Fibonacci number, factorial of number, GCD, Towers of Hanoi; Comparison between iterative and recursive functions. Sorting – Selection sort, Bubble sort, Quick sort, Insertion sort, merge sort. Searching - Sequential Search, Binary search.	13
Unit – 2	
Stacks: Basic Concepts – Definition and Representation of stacks; Operations on stacks; Applications of stacks; Infix, postfix and prefix notations; Conversion from infix to postfix using stack; Evaluation of postfix expression using stack; Application of stack in function calls. **Queues**: Basic Concepts – Definition and Representation of queues; Types of queues – Simple queues, Circular queues, Double ended queues, Priority queues; Operations on Simple queues;	13
Unit – 3	
Dynamic memory allocation: Static & Dynamic memory allocation; Memory allocation and de-allocation functions - malloc, calloc, realloc and free. **Linked list**: Basic Concepts – Definition and Representation of linked list, Types of linked lists - Singly linked list, doubly liked list, Circular linked list; Representation of Linked list in Memory; Operations on Singly linked lists – Traversing, Searching, Insertion, Deletion; Memory allocation.	13
Unit - 4	

Trees: Definition; Tree terminologies –node, root node, parent node, ancestors of a node, siblings, terminal & non-terminal nodes, degree of a node, level, edge, path, depth; Binary tree: Type of binary trees - strict binary tree, complete binary tree, binary search tree and heap tree; Array representation of binary tree. Traversal of binary tree; preorder, inorder and postorder traversal;	13

Text Books

1. Sartaj Sahani: Fundamentals of Data Structures

References

1. Tanenbaum: Data structures using C (Pearson Education)
2. Kamathane: Introduction to Data structures (Pearson Education)
3. Y. Kanitkar: Data Structures Using C (BPB)
4. Sudipa Mukherjee: Data Structures using C – 1000 Problems and Solutions (McGraw Hill Education, 2007))

Course Code: 24MCS2P	**Data Structures Lab**
Course Credits: 02	**Hour of Teaching/Week: 04**
Total Contact Hours: 52	**Formative Assessment Marks: 10**
Exam Duration: 04	**Summative Exam Marks: 40**

Part A

1. write a C Program to read and transpose Matrix (two-dimensional array)
2. Write a C Program to Demonstrate Pointers Operations
3. Write a C Program to Demonstrate Dynamic memory allocation
4. Write a C Program to generate N Fibonacci numbers using a recursive function.
5. Write a C Program to find GCD using recursive function
6. Write a C Program to sort the given list using selection sort technique.
7. Write a C Program to sort the given list using Bubble sort technique

Part B:

1. Write a C Program to find element in Array using Binary search
2. Write a C Program to implement Stack.
3. Write a C Program to convert infix to postfix expression
4. Write a C Program to implement a simple queue.
5. Write a C Program to implement a Circular queue.
6. Write a C Program to implement a linear linked list.
7. Write a C Program to Create Binary search tree
8. Write a C Program to implement traversal of a binary tree.

B.Sc (CS) - III SEMESTER

Course Code: 24MCS3	Object Oriented Programming with Java
Course Credits: 04	Teaching Hours per Week: 04
Total Contact Hours: 52	Internal Assessment : 20
Exam Duration: 03	Semester end Exam Marks: 80

Contents	hours
Unit-1: Object oriented concepts and paradigm, Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, method Overloading, Math class, Arrays in java. Objects and Classes: Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, String Buffer, File, this reference, I/O streams.	12
Unit-2: Inheritance - Inheritance in java, Super and subclass, Overriding, Object class, Polymorphism - Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class. Interfaces - Interfaces Vs Abstract classes, defining an interface, implementing interfaces, extending interfaces. Packages - Defining, creating and accessing a package, Understanding CLASSPATH, importing packages.	14
Unit-3: Exception handling- Dealing with errors, benefits of exception handling, the classification of exceptions- exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally. Multithreading in java: Thread life cycle and methods, Runnable interface, Thread synchronization, Exception handling with try catch-finally, Collections in java, Introduction to JavaBeans and Network Programming.	14
Unit-4: Event and GUI programming: Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing.	12

Reference Books:

1. Programming with Java, By E Balagurusamy – A Primer, Fourth Edition,
2. Core Java Volume I – Fundamentals, By Cay S. Horstmann, Prentice Hall
3. Object Oriented Programming with Java : Somashekara, M.T., Guru, D.S.,Manjunatha, K.S
4. Java 2 - The Complete Reference – Tata McGraw Hill publication.

Course Code: 24MCS3P	JAVA Programming Lab
Course Credits: 02	Teaching Hours per Week: 04
Total Contact Hours: 52	Internal Assessment : 10
Exam Duration: 03	Semester end Exam Marks: 40

Contents

Part - A

1.Program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.

2. Program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends from AddSub class to use the member data of the super class. A main function should access the methods and perform the mathematical operations.

3.Program with class variable that is available for all instances of a class. Use static variable declaration. Observe the changes that occur in the object's member variable values.

4.Program to create a student class with following attributes; Enrollment No: Name, Mark of sub1, Mark of sub2, mark of sub3, TotalMarks. The pass mark for each subject is 50. Using this condition write a constructor for this class.Write separate functions for accepting and displaying student details. In the main method create an array of n student objects and display the details.

5.Create a Class Named College having data members Name of the class (BCA, BCom, BSc), Name of the staff ,No of the students in the class, use constructors

6.Program to define a class called employee with the name and date of appointment. Create employee objects as an array and sort them as per their date of appointment. ie, print them as per their seniority.

7.Program to demonstrate interface in java program.
8.Program to Demonstrate exception handling in java.

PART- B

1. Program to catch Negative Array Size Exception. This exception is caused when the array is initialised to negative values.
2. Program which creates and displays a message on window
3. Program to draw several shapes in the created window
4. Program which creates a frame with two buttons: father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother, similar details of mother also appear.
5. Program to move any one shape according to the arrow key pressed.
6. Program to create a window when we press M or m the window displays Good Morning, A or a the window displays Good After Noon E or e the window displays Good Evening, N or n the window displays Good Night
7. Demonstrate the various mouse handling events using suitable examples.
8. Program to create menu bar and pull-down menus

B.Sc (CS) - IV SEMESTER

Course Code: 24BCA31	Database Management System
Course Credits: 04	Teaching Hours per Week: 03
Total Contact Hours: 52	Internal Assessment : 20
Exam Duration: 03	Semester end Exam Marks: 80

Contents	hours
Unit-1 : Introduction to Database : Database system applications.Characteristics and Purpose of database approach. People associated with a Database system. Data models. Database schema. Database architecture. Data independence . Database languages, E-R Model: Entity-Relationship modeling: E – R Model Concepts: Entity, Entity types, Entity sets, Attributes, Types of attributes.Relationships between the entities. Relationship types, structural constraints. Weak entity types, E -R diagram - examples.	16
Unit-2 : Relational Data Model: Relational model concepts. Characteristics of relations. Relational model constraints: Domain constraints, key constraints, integrity constraints . Relational Algebra: Basic Relational Algebra operations-union ,intersection, selection, projection, cartesian product. JOIN operations.- inner , outer, equi .	12
Unit-3 SQL and Data Normalization: SQL -DML,DDL,DCL,TCL Commands. Aggregate Functions and Grouping. Nested Sub Queries, Views. Normalization - Anomalies in relational database design. . Functional dependencies. Normalization.Types of Normal forms- First normal form, Second normal form, Third normal form. Boyce-Codd normal form.	12
Unit-4 Introduction to PL/SQL programming: Features and Advantages, PL/SQL Blocks - basic syntax, Variables and their scope, Constants, Literals, Data Types, Operators, Executable Statements. Conditional Control: IF Statements , CASE Statements ,Iterative Control: Basic Loops - WHILE and FOR Loops, Reverse FOR LOOP Statement, Nested Loops, Labeling a PL/SQL Loop, exception handling.	12

References :

1. Fundamentals of Database Systems, Ramez Elamassri, Shankant B. Navathe, 7th Edition, Pearson,
2. An Introduction to Database Systems, Bipin Desai, Galgotia Publications, 2010.
3. Introduction to Database System, C J Date, Pearson, 1999.
4. Database Systems Concepts, Abraham Silberschatz, Henry Korth, S.Sudarshan, 6 th Edition,McGraw Hill,
5. Database Management Systems, Raghu Rama Krishnan and Johannes Gehrke, 3rd Edition,McGraw Hill,
6. Oracle Database 11G PL/SQL Programming

Course Code: 24BCA31P	DBMS Lab
Course Credits: 02	Teaching Hours per Week: 04
Total Contact Hours: 52	Internal Assessment : 10
Exam Duration: 03	Semester end Exam Marks: 40

Contents

PART - A

1. Create a table Students with fields: StudentID (Primary Key)Name (VARCHAR)Age (INT)Grade (CHAR).Alter the Students table to add a new column Email (VARCHAR).Rename the Students table to display.

2. Create a table employee table(employee_id, employee_name, employee_dept salary) , insert 5 records into the employee table. perform Update the salary on table referencing the key ,example employee_id = XX .

3.Implementation of different types of constraints.-PRIMARY KEY, FOREIGN KEY, UNIQUE, CHECK.

4. Create two table and Demonstrate different types of Joins operations
a) Inner Join b) Outer Join c) Natural Join

5.Create student table and Implement Aggregation Functions a) Group By & Having clause b) Order by clause

PART- B

1.Write a simple anonymous PL/SQL block to display "Hello, PL/SQL World!".
2.Write a PL/SQL block to check if a number is positive, negative, or zero.
3.Write PL/SQL blocks to demonstrate NO_DATA_FOUND, TOO_MANY_ROWS, ZERO_DIVIDE, DUP_VAL_ON_INDEX

4.Create Simple Cursor : Write a PL/SQL block to retrieve and display the employee_id and employee_name for all employees from an employees table (assume it exists with these columns). display employee names with distinct salaries.

5.Create Simple Cursor : Write a PL/SQL block to retrieve and display the student table and Create a program to categorize students based on CGPA: 'A' for CGPA $\geq$ 9 , 'B' for CGPA $\geq$ 7, 'C' for CGPA $\geq$ 4 , 'D' for others.

OPEN ELECTIVE - I (3rd and 4th Sem)

Course Code: 24BCAOE31	Office Automation
Course Credits: 02	Teaching Hours per Week: 03
Total Contact Hours: 48	Internal Assessment : 10
Exam Duration: 02	Semester end Exam Marks: 40

Contents	hours
Unit-1 : Windows Desktop - GUI: Definition, Standards, Cursors/Pointers, Icons, GUI Menus, GUI-Share Data – Desktop icons and their functions: My computer, My documents, Network neighbourhood, Recycle Bin, Quick launch tool bar, System tray, Start menu, Task bar – Dialog Boxes: List Box, Spin Control Box, Slide, Drop-down list, Radio button, Check box, Text box, Task Bar - System Tray - Quick launch tool bar - Start button - Parts of Windows -Title bar-Menu bar - Scroll bar- Status bar, Maximize, Minimize, close and Resize & Moving a Window – Windows - Start Menu –Help Menu- Preview Menu; Logoff & Shutdown – Keyboard Accelerators: Key board short keys or hotkeys	10
Unit-2 : MS Word - Working with Documents -Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help, Formatting Documents - Setting Font styles, Font selection- style, size, colour etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering. Setting Page style - Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, creating sections & frames, Anchoring & Wrapping, Setting Document styles.	10
Unit-3 MS Excel: Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- opening, saving files, setting Margins, converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data- Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, highlighting values, Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc.,	10
Unit-4 MS Power point: Introduction to presentation – Opening new presentation, Different presentation templates, setting backgrounds, Selecting presentation layouts. Creating a presentation - Setting Presentation style, Adding text to the Presentation. Formatting a Presentation - Adding style, Colour, gradient fills, arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using Draw. Adding Effects to the Presentation- Setting Animation & transition effect. Printing Handouts, Generating Standalone Presentation viewer.	12

References :

1. Computer Concepts and Programming, Padma Reddy
2. Let us C , Yashwanth Kanetkar
3. Ansi C, Balagurusamy
4. Problem solving with C, M. T. Somashekara and D. S. Guru

Course Code: 24BCAOE32	Computer Fundamentals
Course Credits: 02	Teaching Hours per Week: 03
Total Contact Hours: 48	Internal Assessment : 10
Exam Duration: 02	Semester end Exam Marks: 40

Contents	hours
Unit-1 : Fundamentals of Computers: Introduction to Computers - Computer Definition, Evolution and History of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples	12
Unit-2 : Introduction to Computer: Characteristics of computers, Classification of Digital Computer Systems: Microcomputers, Minicomputers, Mainframes, Super computers. Anatomy of Computer: Introduction, Functions & Components of a Computer, Central Processing Unit, Storage units, Input and output Devices. How CPU and memory works. Program execution with illustrative examples. Introduction to microcontrollers.	12
Unit-3 Operating System Fundamentals: Operating Systems: Introduction, Functions of an operating System, Classification of Operating Systems, System programs, Application programs, Utilities, The Unix Operating System, Basic Unix commands, Microkernel Based Operating System, Booting.	12
Unit-4 Introduction to Database Management Systems: Database, DBMS, Why Database -File system vs DBMS, Database applications, Database users, Introduction to SQL, Data types, Classification of SQL-DDL with constraints, DML, DCL, TCL Internet Basics: Introduction, Features of Internet, Internet application, Services of Internet, Logical and physical addresses, Internet Service Providers, Domain Name System.	12

References :

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication

2. David Riley and Kenny Hunt, Computational thinking for modern solver, Chapman & Hall/CRC,

Reference:

3. J. Glenn Brook shear," Computer Science: An Overview", Addision-Wesley, Twelfth Edition,

4. R.G. Dromey, "How to solve it by Computer", PHI,

OPEN ELECTIVE - II

Course Code: 24BCAOE32	Internet Basics
Course Credits: 02	Teaching Hours per Week: 02
Total Contact Hours: 48	Internal Assessment : 10
Exam Duration: 02	Semester end Exam Marks: 40

Contents	hours
Unit-1 : Internet Basics: Basic concepts, communicating on the Internet, Internet ,Difference between the Internet and the World Wide Web (WWW).Basic networking concepts (LAN, WAN) Web server, Web browser – understanding how a browser communicates with a web server, Client issues a request and sends a response, server terminates the connection.	12
Unit-2 : **Search Engines :** What are search engines and how do they work? .Popular search engines (Google, Bing, DuckDuckGo) .Effective search strategies (keywords, advanced search operators) .Evaluating search results for credibility Internet Service Providers (ISPs) and types of connectivity (Dial-up, Broadband, Wi-Fi, Fiber, Mobile Data)	12
Unit-3 **Web Addresses (URLs) :** Structure of a URL (Scheme, Domain, Subdomain, Subdirectory) .Top-Level Domains .Domain Name Extension, establishing connectivity on the internet, Client IP Address – How Client IP Address are assigned, How ISPs achieve the task of assigning IP Address, How IP Address came into existence, A brief overview of	12
Unit-4 Internet Protocols: TCP/IP (Transmission Control Protocol/Internet Protocol). HTTP/HTTPS (Hypertext Transfer Protocol/Secure). FTP (File Transfer Protocol).DNS (Domain Name System) . Learning/Online Education (MOOCs) Cloud-based storage (Google Drive, OneDrive)	12

References :

1. "The Internet Book: Everything You Need to Know about Computer Networking and How the Internet Works" by Douglas E. Comer

Course Code: 24BCAOE32	E-Commerce
Course Credits: 02	Teaching Hours per Week: 02
Total Contact Hours: 48	Internal Assessment : 10
Exam Duration: 02	Semester end Exam Marks: 40

Contents	hours
Unit-1 : Introduction to E-Commerce and Technology Infrastructure E-**commerce and Online Shopping :** e-commerce structure ,Popular online shopping websites ,Safe online shopping practices. Distinction between E-commerce and E-business. Benefits and limitations of E-commerce. E-commerce Business Models: Business-to-Consumer (B2C),Business-to-Business (B2B),Consumer-to-Consumer(C2C),Consumer-to-Business (C2B),Government-to-Citizen (G2C), Government-to-Business (G2B), etc.,Emerging models.	12
Unit-2 : E-commerce Platforms and Solutions: Types of e-commerce platforms (SaaS, open-source, custom-built). Popular platforms (Shopify, WooCommerce, Magento, BigCommerce). Features and considerations for choosing a platform Building an E-Commerce Website, Building an E-commerce Presence: Website design principles for e-commerce (UX/UI, mobile responsiveness). Domain name registration and web hosting. Content Management Systems (CMS) in e-commerce.	12
Unit-3 Digital Marketing Strategies: Search Engine Optimization (SEO) for e-commerce. Search Engine Marketing (SEM) - Paid advertising (Google Ads). Social Media Marketing (SMM) and social commerce. Email Marketing and customer relationship management (CRM). Content Marketing for e-commerce. Affiliate Marketing.	12
Unit-4 Web Analytics and Data-Driven Decision Making: Key e-commerce KPIs and metrics (conversion rate, average order value, customer lifetime value). Tools for web analytics (Google Analytics). Using data to optimize e-commerce performance E-commerce Security: Common security threats (phishing, malware, DDoS attacks, data breaches). Security measures (SSL/TLS, firewalls, encryption). Digital certificates and authentication.	12

References :

1. Kenneth C. Laudon, Carol Guercio Traver - E-Commerce, Pearson, 10th Edition, 2016

2. Laudon, K. C., & Traver, C. G. (Latest Edition). *E-commerce: Business. Technology. Society.* Pearson.

THEORY EXAMINATION QUESTION PAPER PATTERN FOR MAJOR SUBJECTS
(Semesters I –VI)

B.Sc. (CS) Semester-I Degree Examination; 2024-25
(Semester Scheme; New Syllabus: 2024-25)

SUBJECT: COMPUTER SCIENCE

Paper –_____: _____
Paper Code: _____

Time: 3 Hours **Max. Marks: 80**

Instructions to candidates:

1) All sections are compulsory
2) Draw neat and labelled diagrams wherever necessary.

SECTION-A

1. Answer **all** the following questions: **(2×10=20)**

a)
b)
c)
d)
e)
f)
g)
h)
i)
j)

SECTION-B

Answer any **SIX** of the following: **(Two Questions From each Unit)** **(5×6=30)**

2.
3.
4.
5.
6.
7.
8.
9.

SECTION -C

Answer **Any Three** of the following: **(10×3=30)**

10. **From Unit-I**

11. **From Unit-II**

12. **From Unit-III**

13. **From Unit-IV**

THEORY EXAMINATION QUESTION PAPER PATTERN FOR ELECTIVE/OPTIONAL PAPERS

(Semesters III & IV)

B.Sc. Semester-I/II/III/IV/V Degree Examination; 2024-25

(Semester Scheme; New Syllabus: 2024-25)

SUBJECT: COMPUTER SCIENCE

Paper – ELECTIVE/OPTIONAL III & IV ____: _____

Paper Code: _____

Time: 2 Hours **Max. Marks: 40**

Instructions to candidates:

1) All sections are compulsory
2) Draw neat and labelled diagrams wherever necessary.

SECTION-A

Answer **all** the following questions: **(2×5=10)**

1.
2.
3.
4.
5.

SECTION-B

Answer any **SIX** of the following: **(5×6=30)**

6.
7.
8.
9.
10.
11.
12.
13.

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Syllabus Distribution for Question Paper Setting		
Section-A	Ten Questions of each carrying 02 marks	Two questions each from unit-1 and Unit-2. And Three questions each from Unit-3 and unit-4.
Section -B	Eight Questions carrying 06 marks each.	Two questions from each unit.
Section -C	Four Questions carrying 10 marks each	One question from each unit. (There shall be sub-Questions.)