Shri Rawatpura Sarkar University, Raipur

Examination Scheme & Syllabus

for

Bachelor of Computer Application (Computer Science in Engineering)

Semester –III

(Effective from the session: 2022-23)

Department of Computer Science & Engineering

Shri Rawatpura Sarkar University, Raipur
Faculty of Engineering
Bachelor of Computer Application
Semester-III
Teaching & Examination Scheme
(Effective from the session: 2022-23)

S.No.	Course Code	Course Title	Hours / Week			Credits	Maximum Marks			Sem End Exam Duration (Hrs)
			L	T	P		Continuous Evaluation	Sem End Exam	Total	
1	SCA04301	Data Structure	3	1	-	4	30	70	100	3 Hrs
2	SCA04302	Web Designing	3	1	-	4	30	70	100	3 Hrs
3	SCA04303	Introduction to Database Systems	3	1	-	4	30	70	100	3 Hrs
4	SCA04304	Principles of Management	3	1	-	4	30	70	100	3 Hrs
5	SCA04305	Information Technology & System Maintenance	3	1	-	4	30	70	100	3 Hrs
6	SCA04391	Data Structure Lab	-	-	4	2	15	35	50	3 Hrs
7	SCA04392	Web Designing Lab	-	-	4	2	15	35	50	3 Hrs
Total Contact Hrs per week: 28			**Total Credit:24**				**Total Marks: 600**			

SHRI RAWATPURA SARKAR UNIVERSITY, RAIPUR, CHHATTISGARH
FACULTY OF SCIENCE
B.C.A. Third Semester

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2022-2023)

Course Title	**DATA STRUCTURES**				
Course Code	**SCA04301**				
Course Credits	**L**	**T**	**P**	**TC**	
	3	**1**	**-**	**4**	
Prerequisites	Know the classifications of data structures, i.e., linear and non-linear understand the basic operations on linear and non- linear data structures;				
Course Objectives	• Define the term 'data structure' • Explain the memory representation of all types of data structures • Explain how to implement the all kinds of data structures.				
Course Contents	**UNIT- I Introduction:** Basic Terminology, Elementary Data Organization, Algorithm, Efficiency of an Algorithm, Time and Space Complexity, Asymptotic notations: Big-Oh, Time-Space trade-off. Abstract Data Types (ADT) Arrays: Definition, Single and Multidimensional Arrays, Representation of Arrays: Row Major Order, and Column Major Order, Application of arrays. **UNIT-II Stacks:** Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack in C, Application of stack: Prefix and Postfix Expressions, Evaluation of postfix expression, Recursion, Tower of Hanoi Problem, Simulating Recursion, Principles of recursion, Tail recursion, Removal of recursion Queues, Operations on**.** **UNIT- III Trees:** Basic terminology, Binary Trees, Binary Tree Representation: Array Representation and Dynamic Representation, Complete Binary Tree, Algebraic Expressions, Extended Binary Trees, Array and Linked Representation of Binary trees, Tree Traversal algorithms: In order, Preorder and Post order, Threaded Binary trees, Traversing Threaded Binary trees, Huffman algorithm. **UNIT-IV Graphs:** Terminology, Sequential and linked Representations of Graphs: Adjacency Matrices, Adjacency List, Adjacency Multi list, Graph Traversal: Depth First Search and Breadth First Search, Connected Component, Spanning Trees, Minimum Cost Spanning Trees. **UNIT-V Searching:** Sequential search, Binary Search, Comparison and Analysis Internal Sorting: Insertion Sort, Selection, Bubble Sort, Quick Sort, Two Way Merge Sort, Heap Sort, Radix Sort, Practical consideration for Internal Sorting. Search Trees: Binary Search Trees(BST), Insertion and Deletion in BST				

Course Outcomes	• Have a comprehensive knowledge of the data structures and algorithms on which file structures and data bases are based. • Understand the importance of data and be able to identify the data requirements for an application. • Have in depth understanding and practical experience of algorithmic design and implementation
Text Books	1. Aaron M. Tenenbaum, YedidyahLangsam and Moshe J. Augenstein "Data Structures Using C and C/C++" , PHI 2. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication
Reference Books	1. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education 2. Lipschutz, "Data Structures" Schaum's Outline Series, TMH 3. G A V Pai, "Data Structures and Algorithms", TMH

SHRI RAWATPURA SARKAR UNIVERSITY, RAIPUR, CHHATTISGARH
FACULTY OF SCIENCE
B.C.A. Third Semester

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(Effective from the Academic Year 2022-2023)

Course Title	**Web Designing**				
Course Code	**SCA04302**				
Course Credits	**L**	**T**	**P**	**TC**	
	3	**1**	**-**	**4**	
Prerequisites	The aim of this subject is to make the students understand the basic concepts of client server architecture.				
Course Objectives	• The students will also develop competence to use structured query • Language to design and develop client server-based application programs.				
Course Contents	**UNIT I** **INTRODUCTION TO SERVER-SIDE PROGRAMMING:** Introduction to server pages, Understanding client server model, Difference between client-side scripting and server side scripting, Concept of personal web server, Internet information server (IIS). Introduction to active server pages, understanding active server pages & scripts, Creating ASP pages, ASP comment lines, RESPONSE write object, The ASP process. **UNIT II** **INTRODUCTION TO JAVA SCRIPT -** Java script Overview, Java script and the WWW, Java script vs. VBScript, Java script vs. Java, Java script versions, Script element, Inline Java script, Including Java script. Functions : Functions introduction, Calling functions, Java script Comments : Comments overview, When to comment, Types of comments, Variables : Variables overview, Declaring variables, Types of variables, Casting variables, Alert box Expressions : Arithmetic operators, Assignment operators, Logical operators, Expressions and precedence Statements : If statement, For statement, While statement, Break/Continue, Introduction to vb-script **UNIT III** **VB SCRIPT CONTROL STRUCTURES -** if then statement, if then else statement, Nested if statement, Select case statement, Do loop statement, Do while – Do, Do until, while – end statements, For – next statement, For each – next statement, Nesting loops, vb script functions and subroutines, Writing subroutines using Sub - End Sub, Argument passing to a subroutine, Writing functions, Calling functions, VB Script Built-in functions. **UNIT IV** **Concept of objects –** Definition, Properties, Methods, Instances of objects,				

	Response objects, Request object, Application object, Session object, Server object, Context object, ASP error object, communicating with user, Using forms fields, Designing forms, Submitting forms, Reading form values from an ASP, Client side form validation, **UNIT V** ASP COMPONENTS - Using Component in ASP, Using the Ad rotator, Content linker and its users Browser capabilities component, Accessing files and folders using server object, Opening files, Reading files, Writing files to the server, Appending files.
Course Outcomes	• To implement this subject, it is assumed that student is not having knowledge of server-side programming. It is also assumed that the student is well aware of web page designing & client-side programming. While implementing this one should clearly understand client server technology.
Text Books	1. Teach yourself ASP in 21 days by Techmedia, Latest Edn. 2. Teach yourself VB script in 21 Days by Techmedia, Latest Edn.
Reference Books	1. Active server pages by Morneau,Keith,Vikas publication, Latest Edn. 2. ASP 3.0 instant reference by Petroutsos,BPB publication, Latest Edn.

SHRI RAWATPURA SARKAR UNIVERSITY, RAIPUR, CHHATTISGARH
FACULTY OF SCIENCE
B.C.A. Third Semester

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2022-2023)

Course Title	**Introduction to Database System**				
Course Code	**SCA04303**				
Course Credits	**L**	**T**	**P**	**TC**	
	3	**1**	**-**	**4**	
Prerequisites	• The aim of this subject is to get broad understanding of the basic concepts of database system and relational database system in particular. • The students will have theoretical foundation required for working with relational database products, such as SQL.				
Course Objectives	• The student will develop the skills required to design database system taking into consideration functional dependencies, normalization, and entity- relationship and database security aspects using ORACLE RDBMS.				
Course Contents	**UNIT I** **AN OVERVIEW OF DATABASE MANAGEMENT -** What is a database system? What is a database? Why database (advantages and disadvantages), data independence, Data models: Relational, Network & Hierarchical schema and subschema, Database users **UNIT II** **AN ARCHITECTURE FOR A DATABASE SYSTEM:** The three level architecture, mapping, the database administrator, client/server architecture utilities,distributed, processing. **UNIT III** **THE ENTITY /RELATIONSHIP MODEL:** Introduction, the overall approach, an overview of the E/R model, E/R diagrams, database design with the E/R model. the entity /relationship model, Domains and relations: Domain, relations, and kinds of relations, relations and predicates, relational database. Various operations of Relational Algebra(Set operation, Cartesian product, join, logic). **UNIT IV** **RELATIONAL DATA INTEGRITY:** Candidate key and related matters:candidate keys, primary keys and alternate keys, foreign keys and rules. Normalization - 1nf, 2nf, 3nf, BCNF: introduction, non-loss decomposition and functional dependencies, first, second and third forms, dependency preservation, Boyce/coded normal form.				

	UNIT V ORACLE RDBMS - DDL & DML : Data Definition Language (DDL) - Data Manipulation Language, (DML), Data Controlling using SQL - Grant, Revoke, PL/SQL: Introduction to PL/SQL Execution environment, Stored procedure, Database triggers.
Course Outcomes	• This subject should be taught by taking help of different visual aids. (It may be actual part of PC). The students should be demonstrated the possible faults that are encountered where ever possible and he should be explained the process of rectification.
Text Books	1. An Introduction to Data Base System by C. J Date 2. Addision wesley Publication, Sixth Year of Publication 3. Introduction to Database Management System by Navin Prakash Tata McGraw Hill, Latest
Reference Books	1. Concepts of Database Management by Philip J.Pratt & Joseph J. Adamski, Vikas Publishing House, 3rd Edition 2. Database System Concepts by Herry,Korth Tata Mcgraw Hill, Latest

SHRI RAWATPURA SARKAR UNIVERSITY, RAIPUR, CHHATTISGARH
FACULTY OF SCIENCE
B.C.A. Third Semester

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2022-2023)

Course Title	**Principles of Management**				
Course Code	**SCA04304**				
Course Credits	**L**	**T**	**P**	**TC**	
	3	**1**	**-**	**4**	
Prerequisites	Basic knowledge of Management principles and organizing systems.				
Course Objectives	• Students should be able to understand the basic knowledge of modern management systems and their applications.				
Course Contents	**UNIT - I** **MANAGEMENT:** Concept, Nature and Scope of management. The evolution of Management thought, Approaches of management, New classical school, Modern organizational Theories, Behavioral Approach and Systems Approach, Tasks of a professional Manager, Responsibilities of a Professional Manager, Management Systems and Processes, Managerial Skills. **UNIT - II** PLANNING: Significance, Objectives Types of Plans, Strategies & Policies, Proceedings methods & rules Project Management, Planning Evaluation, Feasibility Report, Planning Process Planning under systems approach. **UNIT-III** **ORGANIZING:** Significance, objectives, Major approaches to organizational theory, Organizational Structure and Design, the organizational Process, span of control or Departmentation, Delegation of Authority & Inter Department Coordination, Decentralization, Determinants of effective organizing, staffing, selection, appraisal and development of Managers. **UNIT-IV** **DIRECTING:** Significance and issue in managing human factors. Motivation, nature and significance theories and techniques, Leadership styles and influence process, Leadership challenges. Managerial Communication, definition & Significance, Types of communication, the process and barriers, Building effective communication system, Supervision nature and function, determination of effective supervision. **UNIT-V** **CONTROLLING & DECISION MAKING:** Definition and elements, Control Techniques, Coordination and determinants of an effective control system. Organizational, Context of Decisions, Decision Making Models, Decision Making Techniques and Processes.				

Course Outcomes	• After completion of this course the students will be able to apply their basic knowledge of MIS & its application.
Text Books	1. Principles of Management by Terry Franklin Essentials of Management by Koontz H. O Donnell ;Tata McGraw Hill, New Delhi
Reference Books	1. Management by Stoner J.A.F ; prentice Hall, New Delhi

SHRI RAWATPURA SARKAR UNIVERSITY, RAIPUR, CHHATTISGARH
FACULTY OF SCIENCE
B.C.A. Third Semester

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2022-2023)

<table>
<tr><td>Course Title</td><td colspan="5">Information Technology & System Maintenance</td></tr>
<tr><td>Course Code</td><td colspan="5">SCA04305</td></tr>
<tr><td rowspan="2">Course Credits</td><td>L</td><td>T</td><td>P</td><td>TC</td><td></td></tr>
<tr><td>3</td><td>1</td><td>-</td><td>4</td><td></td></tr>
<tr><td>Prerequisites</td><td colspan="5">Student should have basic knowledge of computer.</td></tr>
<tr><td>Course Objectives</td><td colspan="5">• After the completion of course student should Understand all computer peripherals.
• Understand different languages like programming, machine, assembly etc. PC Assembling and Disassembling.
• To do Windows and application software installation. To do Hardware Device Driver Installation.</td></tr>
<tr><td>Course Contents</td><td colspan="5">UNIT - I
Introduction to information technology: Data and Information, Features of Information, Types of Languages, Low level V/s High level languages, Generations of Programming Language, Introduction Of Machine Language, Introduction of Assembly Language, Fourth Generation Language
UNIT - II
Computer Peripherals (13): Primary Memory : RAM and it’s types (DDRRAM, RDRAM, SDRAM) (02), Secondary Storage Devices: Floppy Disk, Hard Disk, CDROM, DVD (Above all topics Include only principles, types, data storage and Application), Input Devices: Key Board, Mouse, Touch screen, Scanner, (Above all topics Include only principles, types and Application), Output Devices: VDU Printer, (Computer Graphics, Working of CRT, Resolution of different VDU), (Characteristic, Classification, Working, principle, Uses), Communication Devices: MODEM, NIC (Network Interface Card) (Principles, Baud rate, Application).
UNIT-III
Introduction to language processor, software and communication methods Language Processor: Compilers, Interpreter, and Assemblers. Difference between Compiler-Assembler-Interpreter, Types of Software: System Software, Application Software, I/O Communication Methods: Programmed I/O, Interrupts, Direct Memory Access (DMA) (03), Flow of Control – Sequential Flow of Control and Branches, Types of Instructions: Arithmetic Instruction, Logical Instruction, Branch Instruction, Instruction Execution.</td></tr>
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	UNIT-IV **System Maintenance & Support (12):** PC Assembling and Disassembling, Configuring and Troubleshooting BIOS Settings, Installation of Windows XP Professional, Configuring Windows XP Desktop and Display Settings, Application Software Installation, Working with User accounts and Password, Hardware Device Driver Installation, setting up a Network Connection, Configuring IE, Pop-up blocker, IE security and privacy options. **UNIT-V** **Introduction:** Working on NTFS permission, Installing and managing Local and Network printer, Data Backup and Restore & System Restore, Disk and Storage Management, Create/Manage Partition using Disk Mgmt. Utility (compmgmt msc) Optimizing system Performance using Check Disk, Defragmentation and Disk Cleanup Managing services troubleshooting with common issues and Problem Troubleshooting using internet.
Course Outcomes	• This course student will be able to understand the System Maintenance and IT techniques.
Text Books	1. 'O' Level Simple: Information Technology by Satish Kumar- BPB Publications.
Reference Books	1. Information Technology by Fundamentals of computer by V. Rajaraman PHI Publications. 2. Structure computer Organization by Andrew S. Tanenbaum-PHI Publications.

SHRI RAWATPURA SARKAR UNIVERSITY, RAIPUR, CHHATTISGARH
FACULTY OF SCIENCE
B.C.A. Third Semester

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2022-2023)

Course Title	**Data Structure LAB**				
Course Code	**SCA04391**				
Course Credits	**L**	**T**	**P**	**TC**	
	-	**-**	**4**	**2**	
Prerequisites	Know the classifications of data structures, i.e., linear and non-linear understand the basic operations on linear and non- linear data structures;				
Course Objectives	• Explain the memory representation of all types of data structures • Explain how to implement the all kinds of data structure				
Course Contents	**PRACTICALS :** List of Experiments: 1. Write a program to perform following operations in one dimensional array-Insertion. 2. Write a program to implement stack and perform push operations. 3. Write a program to implement stack and perform pop operations. 4. Write programs to perform Insertion sort. 5. Write programs to perform selection sort. 6. Write programs to perform bubble sort 7. Write a program to perform a quick sort. 8. Write a program to perform following operations on a link list –creation, insertion. 9. Write a program to perform following operations on a link list –creation, deletion. 10. Write a program to implement a linked stack and linked queue.				
Course Outcomes	Have a comprehensive knowledge of the data structures and algorithms on which file structures and data bases are based				
Text Books	1. “Data structure using C” by Samir Kumar Bandyopadhyay, Kashinath Dey 2. “C and Data structures” by Ashok K Kamthane Pearson Education. 3. “An Introduction to Data Structures with Application” by Tremblay & Sorenson (TMH)				

Reference Books	1. "Fundamentals of Data Structure" by Horowitz &Sahni (Golgotia) 2. "Data Structures using C/C++" by Rajesh Shukla, Wiley India 3. "Data Structures using C" by ISRD Group (TMH) 4. "Data Structures using C/C++" by Langsam, Augenstein&Tananbaum (PHI) 5. "Data Structures & Program Design" by Robert L Kruse (PHI

SHRI RAWATPURA SARKAR UNIVERSITY, RAIPUR, CHHATTISGARH
FACULTY OF SCIENCE
B.C.A. Third Semester

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2022-2023)

Course Title	**Web Designing LAB**				
Course Code	**SCA04392**				
Course Credits	**L**	**T**	**P**	**TC**	
	-	**-**	**4**	**2**	
Prerequisites	• The aim of this subject is to make the students understand the basic concepts of client server architecture.				
Course Objectives	• The students will also develop competence to use structured query language to design and develop client server based application program.				
Course Contents	**PRACTICALS :** Practical's (Any 10 Practicals) • Assignment based on client server model. • Assignment based on terminology related to dynamic web pages • Assignments to write character, data types, operators & symbols of WB • scripts. • A simple program on dim statement and arithmetic calculation. • A program based on each • if • Select case • Do loop • While • For next • A program based on each • Subroutines • Argument passing to sub routine • Built-in function • Designing a form and submit • Information collection using request object • Reading and writing cookies. • Browser name and version • File handling				

	• Read data from database & process it • Update the database • Deleting the data
Course Outcomes	To implement this subject, it is assumed that student is not having knowledge of server-side programming. It is also assumed that the student is well aware of web page designing & client-side programming. While implementing this one should clearly understand client server technology.
Text Books	1. Teach yourself ASP in 21 days by Techmedia, Latest Edn. 2. Teach yourself VB script in 21 Days by Techmedia, Latest Edn.
Reference Books	1. Active server pages by Morneau,Keith,Vikas publication, Latest Edn. 2. ASP 3.0 instant reference by Petroutsos,BPB publication, Latest Edn.