

Shri Rawatpura Sarkar University, Raipur



Examination Scheme & Syllabus

For

**Bachelor of Science in Computer Science &
Information Technology**

In

Computer Science

Semester-I

(Effective from the session: 2022-23)

**Faculty of Engineering,
Shri Rawatpura Sarkar University, Raipur**



**SHRI RAWATPURA SARKAR UNIVERSITY, RAIPUR,
CHHATTISGARH**

FACULTY OF ENGINEERING

Three Years B.Sc(CS & IT) Programme

Scheme of Teaching and Examination

Bachelor of Science with Computer Science – Ist Semester

Computer Science Engineering

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

(Effective from the Academic Year 2022-2023)

Sr. No.	Course Code	Course Title	Hours / Week			Credits	Maximum Marks			Sem End Exam Duration (Hrs)
			L	T	P		Continous Evaluation	Sem End Exam	Total	
1	SBS04111	Language & Communication Skills	3	1	-	4	30	70	100	3 Hr.
2	SBS04101	Discrete Structure	4	1	-	5	30	70	100	3 Hr.
3	SBS04102	Problem Solving using C Language	3	1	-	4	30	70	100	3 Hr.
4	SBS04103	Fundamental of Information Technology	3	1	-	4	30	70	100	3 Hr.
5	SBS04104	Operating System	3	1	-	4	30	70	100	3 Hr.
6	SBS04191	Problem Solving using C Language Lab	-	-	4	2	15	35	50	3 Hr.
7	SBS04192	Office Automation Lab	-	-	4	2	15	35	50	3 Hr.
Total Contact hr. per week: 27			Total Credit			25	165	420	600	



**SHRI RAWATPURA SARKAR UNIVERSITY, RAIPUR,
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FACULTY OF COMPUTER SCIENCE & ENGINEERING

B.Sc(CS & IT) First Semester

Course Title	LANGUAGE & COMMUNICATION SKILLS				
Course Code	SBS04111				
Course Credits	L	T	P	TC	
	2	-	-	2	
Prerequisites	Basic knowledge about English language and communication skill.				
Course Objectives	<ol style="list-style-type: none">1. Understand the role of communication in personal & professional success.2. Develop awareness of appropriate communication strategies.3. Prepare and present messages with a specific intent.4. Analyze a variety of communication acts.				
Course Contents	<p>UNIT – I</p> <p>Vocabulary:</p> <p>Vocabulary, knowledge of at least one thousand words with their spelling, Meanings and usage Phrases.</p> <p>UNIT – II</p> <p>Structure of sentences:</p> <p>Structure of sentences: Simple, Complex and Compound. Clauses and Subordinate clauses.</p> <p>UNIT – III</p> <p>Tenses:</p> <p>The tenses and aspects. The modal, The gerund, The participle, The infinitive.</p> <p>UNIT – IV</p> <p>Transformation of sentences:</p> <p>Transformation of sentences:</p> <ol style="list-style-type: none">1. Interchange of Active and Passive Voice.2. Interchange of Affirmative and Negative Sentences.3. Interchange of Explanative and Assertive Sentences.4. Interchange of interrogative and Assertive Sentences.5. Direct and Indirect Speech.				

	<p>UNIT – V</p> <p>Application of Grammar:</p> <p>Practical application of grammar. Practice in talks, Conversation and writing. Report writing.</p> <p>Writing of applications, Letter writings, Description of events.</p>
Course Outcomes	<ol style="list-style-type: none"> 1. This course student will be able to understand the literatures for presenting the real extract of the subject to the society. 2. The student will acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.
Text Books	<ol style="list-style-type: none"> 1. Living English Structure, W.S. Allen. 2. A Practical English Grammar, Thomson and Martinet.
Reference Books	<ol style="list-style-type: none"> 1. Practical English Usage. Michael Swan. OUP. 1995. 2. Remedial English Grammar. F.T. Wood. Macmillan.2007 3. On Writing Well. William Zinsser. Harper Resource Book. 2001 4. Study Writing. Liz Hamp-Lyons and Ben Heasley. Cambridge University Press. 2006. 5. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011.



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FACULTY OF COMPUTER SCIENCE & ENGINEERING

B.Sc(CS & IT) First Semester

Course Title	DISCRETE STRUCTURES			
Course Code	SBS04101			
Course Credits	L	T	P	TC
	4	1	-	5
Prerequisites	To introduce a number of discrete mathematical structures found to be serving as tools in the development of theoretical computer science.			
Course Objectives	<ol style="list-style-type: none">1. Demonstrate critical thinking, analytical reasoning, and problem solving skills.2. Apply appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.3. Identify a problem and analyze it in terms of its significant parts and the information needed to solve it.4. Formulate and evaluate possible solutions to problems, and select and defend the chosen solutions.			
Course Contents	<p>UNIT- I MATHEMATICAL LOGIC & BOOLEAN ALGEBRA:Basic concept of mathematical logic, Statements, Connectives, Conditional and biconditional statements, Logical equivalence, Logical implication & quantifiers, Basic concept of Boolean Algebra.</p> <p>UNIT-II SET THEORY, RELATIONS, FUNCTIONS:Basic concept of set theory, Relations, Properties of relation in a set,Equivalence relation, Composition of relations, Partial order & total order relations, Lattices &Hassediagram,Introduction to function, Inverse, Identity, Injective, Surjective&Bijective functions, Composition of functions and some special functions.</p> <p>UNIT- III ALGEBRAIC STRUCTURES:Groups, Subgroups, Cosets, Lagrange’s theorem, Isomorphism, Automorphism, Homomorphism, Codes & group codes, Rings, Integral domains and Fields.</p> <p>UNIT-IV GRAPH THEORY:Introduction to graph theory, Walks, Paths & Circuits, Types of graphs, Shortest path problems, Eulerian and Hamiltonian graphs, Basic concept of tree: spanning tree, minimum spanning tree, search tree, rooted binary tree, Cut sets, Network flow, Matrix representation of graphs.</p> <p>UNIT-V COMBINATORICS:Permutation and combination, Pigeon-hole principle, Mathematical</p>			

	induction, Principle of Inclusion and Exclusion, Generating function, Recurrence relation.
Course Outcomes	<ol style="list-style-type: none"> 1. Able to apply mathematical logic and Boolean algebra in switching circuits & logic circuits. 2. Familiar with set theory, relation and functions. 3. Familiar with algebraic structures, graph theory and combinatory. 4. Able to solve problems in various fields in computer science, specially networking.
Text Books	<ol style="list-style-type: none"> 1. Elements of discrete mathematics by C.L. Liu, Tata McGraw-Hill, publications. 2. Discrete Mathematical structures, by Bernard Kolman, Robert C. Busby and Sharon Cutler Ross, Pearson Education.
Reference Books	<ol style="list-style-type: none"> 1. Discrete mathematics for computer scientists and mathematicians, by J.L. Mott, A. Kandel and T.P. Baker, Prentice Hall of India. 2. Discrete Mathematical Structures with applications to computer science, by J.P. Tremblay and R. Manohar, Tata McGraw- Hill.



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FACULTY OF COMPUTER SCIENCE & ENGINEERING

B.Sc(CS & IT) First Semester

Course Title	PROBLEM SOLVING USING C LANGUAGE				
Course Code	SBS04102				
Course Credits	L	T	P	TC	
	3	1	-	4	
Prerequisites	Basic knowledge about C programming and problems.				
Course Objectives	<ul style="list-style-type: none"> • To differentiate and understand low-level and high-level programming languages. • To understand modular programming concepts. • To understand the use of rich set of data types in C appropriate to specific programming problems. • Demonstrate the use of various operators. 				
Course Contents	<p>UNIT - I</p> <p>Introduction: Computer systems, Hardware & software concepts. Problem Solving: Algorithm / pseudo code, flowchart, program development steps, Computer Languages: machine, symbolic, and high -level languages, Creating and running programs: Writing, editing, compiling, linking, and executing.</p> <p>Basics of C: Structure of a C program, identifiers, basic data types and sizes. Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation, Sample programs.</p> <p>UNIT - II</p> <p>Bit-wise Operators: logical, shift, rotation, masks. Selection – Making Decisions: Two - way selection: if - else, null else, nested-if, examples, Multi- way selection: switch, else-if, examples. Strings: concepts, C strings. Iterative: Loops -while, do-while and for statements, break, continue, initialization an updating, event and counter. Controlled loops, looping applications: Summation, powers, smallest and largest.</p> <p>UNIT - III</p> <p>Arrays: Arrays-concepts, declaration, definition, accessing elements, storing elements, Strings and string manipulations, 1-D arrays, 2-D arrays and character arrays, string manipulations, multidimensional arrays, array applications: Matrix Operations, checking the symmetry of a Matrix.</p>				

	<p>Functions -Modular programming: Function basics, parameter passing, storage classes (extern, auto, register, static), scope rules, block structure, user defined functions, standard library functions, recursive functions. Recursive solutions for Fibonacci series and Towers of Hanoi. Header files, C pre-processor. Examples C programs on Passing 1-D arrays and 2-D arrays to functions.</p> <p>UNIT - IV</p> <p>Pointers: Pointers concepts, initialization of pointer variables, pointers and function arguments, passing by address – dangling memory, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory management functions, command line arguments.</p> <p>UNIT - V</p> <p>Enumerated, Structure and Union:Derived types – structures, structure declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, & typed, bit-fields, program applications.</p> <p>File Handling: Input and output – concept of a file, text files and binary files, Formatted I/O, file I/O operations, example programs.</p>
<p>Course Outcomes</p>	<p>After completion of the course study, students will be able to-</p> <ol style="list-style-type: none"> 1. Use and differentiate between basic concepts of computer hardware and software. 2. Use data representation for the fundamental data types in C and perform conversions between binary & 3. Hexadecimal & Decimal date representations. 4. Read, understand and trace the execution of programs written in C language.
<p>Text Books</p>	<ol style="list-style-type: none"> 1. “The C –Programming Language” by B.W. Kernighan, Dennis M. Ritchie, PHI. 2. “Programming in C” by E. Balagurusamy (TMH). 3. “C Programming: A Problem - Solving Approach” by Forouzan, E. V. Prasad, Giliberg, Cengage, 2010.
<p>Reference Books</p>	<ol style="list-style-type: none"> 1. “Programming in C” by Stephen G. Kochan, 3/e Pearson, 2000. 2. “C Programming Laboratory Handbook For Beginners” by Sidnal, Wiley India.



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FACULTY OF COMPUTER SCIENCE & ENGINEERING

B.Sc(CS & IT) First Semester

Course Title	FUNDAMENTAL OF INFORMATION TECHNOLOGY				
Course Code	SBS04103				
Course Credits	L	T	P	TC	
	3	1	-	4	
Prerequisites	Basic knowledge about Computer Fundamental.				
Course Objectives	<ul style="list-style-type: none">• To learn the Computer Fundamental concepts.• To aware students about Software and Hardware.• To make them to use basic components of MS Office.• To give the foundations for different Applications of Google.				
Course Contents	<p>UNIT – I :</p> <p>Basics of Computer :- What is Computer?, Introduction to Computing, History of Computers, Application and Issues of Computer, Components of Computer: Input Devices, Output Devices, System Unit, Storage Devices, Communication Devices; Computer Building Blocks: CPU, Hardware Devices: External Connectivity, Video Port, USB Port, all other Ports.</p> <p>UNIT - II</p> <p>Processing Unit :- Processor Building Blocks: Control Unit, Arithmetic Logic Unit, Register Unit, Comparison of Personal Computer Processors, Processor for Mini, Mainframe, Large and Super Computers, Examples of Various Processor and their families, Category of Processor on basis of Word length, Working of Processor and Execution Process, Machine Cycle, System Clock.</p> <p>UNIT - III</p> <p>Memory and I/O Devices :- Types of Memory: RAM, Cache, ROM, Flash Memory, CMOS, loud Storage, Optical Discs: CDs, DVDs. Memory Hierarchy, Input Devices: Keyboard, Mouse, Trackball, Touchpad, Pointing Stick, and others; Output Devices: LCD Plasma Monitors, other Monitors, Printers: Nonimpact, Ink-Jet, Photo, Laser Printers, Plotters, Speakers, Headphones, and Ear-buds, Data Projectors, Interactive Whiteboards.</p> <p>UNIT - IV</p> <p>Category of Software with example and brief features:- Introduction to Software (s/w), Types of s/w: Application Software System Software, Various Application Software s/w and their examples, System Programming and System Programs, Needs of System Software, BIOS, POST sequence, Concept introduction to various system s/w such as:</p>				

	<p>Assemblers, Loaders, linkers, macro processors, Macros, Compilers, Interpreters, Operating system and formula system, Translators and its types, Editor, Simulator, Emulator, Debugger, Device Drivers, Firmware etc. Assemblers: Structure of assembler, Overview of the assembly process, Basic function, Machine dependent and machine independent features of assembler, Types of assemblers – single pass, multi-pass, cross assembler, Macros processors.</p> <p>UNIT - V</p> <p>Loaders and Compilers :- Basic Loader Functions, Linking and Concept of Static Dynamic Relocation, Various loader schemes with their advantages and disadvantages, Compilers, Phases of a Compiler, Comparison of Compilers Interpreters, Machine dependent Machine Independent Compiler Features, Aspects of Compilation, Lexical Analysis, Syntax Analysis, Memory Allocation, Compilation of Expressions; Code optimization – local and global optimization.</p>
Course Outcomes	<p>After completion of the course study, students will be able to-</p> <ol style="list-style-type: none"> 1. To familiar with Computer Fundamental 2. To know about MS Office. 3. To use different text, spreadsheet and presentation skills. 4. To apply different applications online. 5. To know about Google Products.
Text Books	<ol style="list-style-type: none"> 1. Computer Basics by IGNOU. 2. Suresh K Basendra: Computers Today 3. Pradeep K. Sinha, Priti Sinha, “Computer Fundamentals”. BPB Publications. 4. Rajaraman, V., “Fundamental of Computers”. Prentice Hall India, New Delhi 5. Sanders Donald H Computers Today
Reference Books	<ol style="list-style-type: none"> 1. Peter Norton, “Introduction to Computers”,4th Edition, TMH Ltd, New Delhi, 2017. 2. R.G. Dromey,”How to solve it by Computers”, Pearson Publishers, New Delhi, 2007. 3. Dorothy House, “Microsoft Word, Excel, and PowerPoint: Just for Beginners, 2015



SHRI RAWATPURA SARKAR UNIVERSITY, RAIPUR, CHHATTISGARH

FACULTY OF COMPUTER SCIENCE & ENGINEERING

B.Sc(CS & IT) First Semester

Course Title	OPERATING SYSTEM				
Course Code	SBS04104				
Course Credits	L	T	P	TC	
	3	1	-	4	
Prerequisites	To understand about the basic concepts relating to operating systems and its features.				
Course Objectives	<ol style="list-style-type: none"> 1. Students will learn how Operating System is Important for Computer System. 2. To make aware of different types of Operating System and their services. 3. To learn different process scheduling algorithms and synchronization techniques to achieve better performance of a computer system. □ To know virtual memory concepts. 4. To learn secondary memory management. 				
Course Contents	<p>UNIT – I</p> <p>Introduction: Role of OS: Types of OS, Batch Systems; Multiprogramming; Time Sharing; Distributed & Real time OS. Computer structure and OS: System Architecture – I/O, Storage, Processors; System components- OS Services, System Calls , System Programs; System Design, Implementation and Generation.</p> <p>UNIT – II</p> <p>Process Management: Concepts of process: Process status, Process description, Process model. Process Scheduling: Concepts, Scheduler organization, preemptive and non-preemptive scheduler strategies, scheduling algorithms: FCFS, SJN, Priority Scheduling, Round Robin Scheduling, Multiple Processor scheduling, Thread Concepts and Multiple threaded OS.</p> <p>UNIT – III</p> <p>Process Synchronization and Deadlock: Process Co-operation, Concepts of Inter-process communication, Process Synchronization, Synchronization Issues, Critical Section problem, Mutual exclusion Primitives and Algorithms, Process Synchronization with semaphores. Concepts of Deadlock, Conditions for Deadlocks, Resource Concepts & Abstractions, Deadlock Prevention, Avoidance and Recovery, Banker Algorithms for Deadlock Avoidance</p> <p>UNIT – IV</p> <p>Memory Management and File system: Paging, Segmentation and Contiguous memory allocation. Virtual Memory: Demand Paging, Page replacement and Frame Allocation policies, Thrashing. File System: Concepts, Access Method, Directory Structure, and File</p>				

	<p>System Management.</p> <p>UNIT – V</p> <p>Disk management and other issues: Disk management: Disk Structure and Scheduling. File systems, and operating system support for distributed systems. Protection and Security related issues. Case studies of contemporary operating systems.</p>
Course Outcomes	<ul style="list-style-type: none"> • Understands the different services provided by Operating System at different level. • They learn real life applications of Operating System in every field. • Understands the use of different process scheduling algorithm and synchronization techniques to avoid deadlock. • They will learn different memory management techniques like paging, segmentation and demand paging etc.
Text Books	<ol style="list-style-type: none"> 1. Operating System concepts by Silberschatz A and Peterson, J.L, PE- LPE. 2. Operating System Design & Implementation by Tanenbaum, A.S., PHI. 3. Operating system concepts Galvin by Silberschatz, John Wiley& Sons
Reference Books	<ol style="list-style-type: none"> 1. Operating System in Depth Design and Programming by Thomas Doeppner, Wiley India. 2. Operating System Concept & Design, Milenkovic M, McGraw Hill. 3. Operation System, Stalling William, Maxwell MCMillan International Editions



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FACULTY OF COMPUTER SCIENCE & ENGINEERING

B.Sc(CS & IT) First Semester

Course Title	PROBLEM SOLVING USING C LANGUAGE LAB				
Course Code	SBS04191				
Course Credits	L	T	P	TC	
	-	-	4	2	
Prerequisites	Basic knowledge about C programming.				
Course Objectives	<ul style="list-style-type: none">• To differentiate and understand low-level and high-level programming languages• To understand modular programming concepts• To understand the use of rich set of data types in C appropriate to specific programming problems.• Demonstrate the use of various operators				
Course Contents	<p>List of Experiments: (At least Ten experiments are to be performed by each student)</p> <ol style="list-style-type: none">1. Write a C program to take the radius of a sphere as input and print the volume and surface area of that sphere.2. Write a C program to take a 5-digit number as input and calculate the sum of its digits.3. Write a C program to take three sides of a triangle as input and verify whether the triangle is an isosceles, scalene or an equilateral triangle.4. Write a C program that will take 3 positive integers as input and verify whether they form a Pythagorean triplet or not.5. Write a C program to print all prime numbers between a given ranges of numbers.6. Write a C program to define a function that will take an integer as argument and return the sum of digits of that integer7. Write a C program to define a macro that can calculate the greater of two of its arguments. Use this macro to calculate the greatest of 4 integers.8. Write a C program to define a recursive function that will print the reverse of its integer argument.9. Write a C program to print the sum of first N even numbers using recursive function.10. Write a C program to sort an array using Bubble sort technique.				
Course Outcomes	<ul style="list-style-type: none">• Use and differentiate between basic concepts of computer hardware and software.				

	<ul style="list-style-type: none">• Use data representation for the fundamental data types in C and perform conversions between binary- hexadecimal decimal date representations.• Read, understand and trace the execution of programs written in C language.
Text Books	<ol style="list-style-type: none">1. C Programming Laboratory by Dr.Nandini S. Sidnal, Wiley India, 2012.2. C language author by Balaguruswami.
Reference Books	<ol style="list-style-type: none">1. C language author by YashwanthKanitkar.2. C language author by Brian Kernighan.



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FACULTY OF COMPUTER SCIENCE & ENGINEERING

B.Sc(CS & IT) First Semester

Course Title	OFFICE AUTOMATION LAB				
Course Code	SBS04192				
Course Credits	L	T	P	TC	
	-	-	4	2	
Prerequisites	Basic knowledge of Microsoft Application.				
Course Objectives	<ol style="list-style-type: none">1. Student should be able to understand the basic knowledge of Microsoft Application.2. office tools course would enable the students in crafting professional word documents, excel spread sheets, power point presentations using the Microsoft suite of office tools.3. To familiarize the students in preparation of documents and presentations with office automation tools.				
Course Contents	<p>MS WORD:</p> <p>Adding text, editing text, finding and replacing text, formatting text, character/line/paragraph spacing, working with styles and text indentation. Saving document with and without password.</p> <p>Working with page layout, page setup i.e. setting margins, changing page size, changing page orientation and applying page background.</p> <p>Printing a document. □ Inserting page numbers, headers and footers, footnote, endnote, date and time, pictures, objects, shapes etc.</p> <p>Creating bulleted and numbered lists.</p> <p>Working with tables, paragraphs and columns.</p> <p>Reviewing (track changes, adding comments etc.) and proof reading a document i.e. spellcheck grammar etc.</p> <p>Creating and working with table of content.</p> <p>Mail merge.</p> <p>MS EXCEL:</p> <p>Entering data, formatting data i.e. applying borders, various formats (currency formats, number formats etc.), fonts etc.</p> <p>Creating custom lists, using auto fill, find and replace and editing text (cut, copy, paste and paste special).</p>				

	<p>Working with formulae and functions.</p> <p>Applying conditional formatting to data.</p> <p>Sorting and filtering data (auto and advanced filter).</p> <p>Performing Subtotals. □ What-if-analysis using goal seek, scenarios and solver.</p> <p>Pivot tables and data tables (one and two table input).</p> <p>Working with charts (2D and 3D).</p> <p>Adding comments,password protection to the workbook.</p> <p>Working with page layout and printing options.</p> <p>MS POWERPOINT:</p> <p>Creating and formatting slides in a presentation.</p> <p>Create a master slide with a logo, footer, and font.</p> <p>Add notes to each slide.</p> <p>Insert a graphic or picture.</p> <p>Implement a background.</p> <p>Place a text box in the title slide with your name.</p> <p>Insert transitions for each slide.</p> <p>Applying various effects (custom animation and transitional effects) in a presentation.</p>
<p>Course Outcomes</p>	<p>After completion of this course the students will be able to</p> <ul style="list-style-type: none"> • apply their basic knowledge of Microsoft Application. • to perform documentation. • to perform accounting operations. • to perform presentation skills.
<p>Text Books</p>	<ol style="list-style-type: none"> 1. Windows XP Complete Reference. BPB Publications. 2. MS Office XP Complete Bpb Publication.
<p>Reference Books</p>	<p>MS Windows Xp Home Edition Complete, Bpb Publication.</p> <p>Joe Habraken, Microsoft Office 2000, 8 in 1, By, Prentice Hall Of India.</p>