

Department of Computer Science
Course Outcome-2022-23

NEP I sem

Course Title: Computer Fundamentals and Programming in C [DSC]

Course	Outcome
Fundamentals of Computers	CO1: Introduction to Computers. Introduction to C Programming.
C Programming Basic Concepts	CO 2: To learn character set, tokens and input, output in c.
Control Structures	CO 3: Learning all decision making and looping structures of c. Strings of c.
Pointers in C	CO 4: Introduction about pointers, get to learn how to define functions, user defined data types.

Practical (Computer Fundamentals and Programming in C) [DSC]

CO1: Read three numbers and find the biggest of three numbers.

CO2: Generate n primes.

CO3: Read a number, find the sum of the digits, reverse the number and check it for palindrome.

CO4: Read percentage of marks and to display appropriate message (Demonstration of else-if ladder).

CO5: Find the roots of quadratic equation (demonstration of switch-case statement)

CO6: Remove Duplicate Element in a single dimensional Array.

CO7: Perform addition and subtraction of Matrices.

CO8: Demonstrate string functions.

CO9: Demonstrate pointers in C.

CO10: Read, display and add two m x n matrices using functions.

CO11: Read, display and multiply two m x n matrices using Functions.

CO12: Read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.

CO13: Swap Two Numbers using Pointers.

CO14: Demonstrate student structure to read & display records of n students.

CO15: Demonstrate the difference between structure & union

Course Title: C Programming Concepts [OEC]

Course	Outcome
Introduction to C Programming	CO1: Learning c introduction, compilation, c programming basic concepts like character set, tokens, variables.
Input and output with C	CO2: Introduction to formatted input/output and unformatted input/output. Operators and expressions.
Control Structures	CO3: Learning all decision making and looping structures of c, study of arrays.
Strings	CO4: Study about strings, user defined functions.

Course Title: Digital Fluency [SEC]

Course	Outcome
Emerging Technologies	Overview of Emerging Technologies. Artificial Intelligence ,Big Data Analytics ,Internet of Things, Cloud Computing, Cyber Security.
Applications of Emerging Technologies	Applications of emerging technologies: Artificial Intelligence ,Big Data Analytics ,Internet of Things, Cloud Computing, Cyber Security.
Applications of Emerging Technologies	Importance of the following Effective Communication Skills, Creative Problem Solving & Critical Thinking , Collaboration and Teamwork Skills, Innovation & Design Thinking, Use of tools in enhancing skills

K.L.E. Society's
Raja Lakhamagouda Science Institute (Autonomous),
Belagavi National Education Policy (NEP) 2021-2022
Department of Computer Science
B.Sc. I Semester

Course Code: 21CS101

Course Title: Computer Fundamentals and Programming in C [DSC]

Total Credits: 4

Unit	Contents	Hours
I	<p>Fundamentals of Computers: Introduction to Computers - Computer Definition, Characteristics of Computers, Evolution and History of Computers, Types 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.</p> <p>Introduction to C Programming: Over View of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C.</p>	14
II	<p>C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants.</p> <p>Input and output with C: Formatted I/O functions - printf and scanf, control stings and escape sequences, output specifications with printf functions; Unformatted I/O functions to read and display single character and a string - getchar, putchar, gets and puts functions. C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.</p>	14

III	<p>Control Structures: Decision making Statements - Simple if, if_else, nested if_else, else_if ladder, Switch-case, goto, break & continue statements; Looping Statements - Entry controlled and Exit controlled statements, while, do-while, for loops, Nested loops. Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.</p> <p>Strings: Declaring & Initializing string variables; String handling functions - strlen, strcmp, strcpy and strcat; Character handling functions - toascii, toupper, tolower, isalpha, isnumericetc.</p>	14
IV	<p>Pointers in C: Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and disadvantages of using pointers;</p> <p>User Defined Functions: Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.</p> <p>User defined data types: Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.</p>	14
TOTAL		56

Text Books:

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

Reference Books:

1. Kamthane: Programming with ANSI and TURBO C (Pearson Education)
2. V. Rajaraman: Programming in C (PHI -EEE)
3. S. Byron Gottfried: Programming with C(TM)
4. Kernighan & Ritchie: The C Programming Language(PHI)
5. Yashwant Kanitkar: Let us C.

K.L.E. Society's
Raja Lakhamagouda Science Institute (Autonomous), Belagavi
Department of Computer Science

B.Sc . I Semester NEP (2021-2022)

Computer Fundamentals and Programming in C [DSC]

Blueprint

Duration: 2 Hours

Max. Marks: 60

SI.No	Units	No.of questions for 2 Marks	No.of questions for 4 Marks	No.of questions for 8 Marks	Total Marks
1	Unit 1: Fundamentals of Computers	2	2	2	28
2	Unit 2: C Programming Basic Concepts	2	2	2	28
3	Unit3: Control Structures	2	2	2	28
4	Unit4: Pointers in C.	2	2	2	28
Total Number of Questions		8	8	8	112

Course Code: 21CS102

Practical (Computer Fundamentals and Programming in C) [DSC]

Total Credits: 2

Lab Programs:

Duration of each practical: 4 Hours

1. Write a C Program to read three numbers and find the biggest of three numbers.
2. Write a C Program to generate n primes.
3. Write a C Program to read a number, find the sum of the digits, reverse the number and check it for palindrome
4. Write a C Program to read percentage of marks and to display appropriate message (Demonstration of else-if ladder)
5. Write a C Program to find the roots of quadratic equation (demonstration of switch-case statement)
6. Write a C Program to remove Duplicate Element in a single dimensional Array
7. Program to perform addition and subtraction of Matrices
8. Write a C Program to demonstrate string functions.
9. Write a C Program to demonstrate pointers in C
10. Write a C Program to read, display and add two m x n matrices using functions
- 11.11. Write a C Program to read, display and multiply two m x n matrices using Functions.
12. Write a C Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
13. Write a C Program to Swap Two Numbers using Pointers.
14. Write a C Program to demonstrate student structure to read & display records of n students.
15. Write a C Program to demonstrate the difference between structure & union.

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program – 1	Writing the Program	04
	Execution and Formatting	04
Program -2	Writing the Program	04
	Execution and Formatting	04
Viva Voice		04
Journal		05
Total		25

K.L.E. Society's
Raja Lakhamagouda Science Institute (Autonomous), Belagavi
National Education Policy (NEP) 2021-2022
Department of Computer Science
B.Sc. I Semester

Course Title: C Programming Concepts [OEC]
3

Total Credits:

Unit	Contents	Hours
I	<p>Introduction to C Programming: Overview of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C.</p> <p>C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants.</p>	10
II	<p>Input and output with C: Formatted I/O functions – <i>printf</i> and <i>scanf</i>, control strings and escape sequences, output specifications with <i>printf</i> functions; Unformatted I/O functions to read and display single character and a string - <i>getchar</i>, <i>putchar</i>, <i>gets</i> and <i>puts</i> functions</p> <p>C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.</p>	10
III	<p>Control Structures: Decision making Statements - Simple if, if_else, nested if_else, else_if ladder, Switch Case, goto, break & continue statements; Looping Statements - Entry controlled and exit controlled statements, <i>while</i>, <i>do-while</i>, <i>for</i> loops, Nested loops.</p> <p>Derived data types in C: Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.</p>	12
IV	<p>Strings: Declaring & Initializing string variables; String handling functions - <i>strlen</i>, <i>strcmp</i>, <i>strcpy</i> and <i>strcat</i>; Character handling functions - <i>toascii</i>, <i>toupper</i>, <i>tolower</i>, <i>isalpha</i>, <i>isnumeric</i> etc</p>	10

	User Defined Functions: Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.	
TOTAL		42

Text Book:

1. C: The Complete Reference, By Herbert Schildt.
2. C Programming Language, By Brian W. Kernighan
3. Kernighan & Ritchie: The C Programming Language (PHI)

Reference Books:

1. E. Balaguruswamy: Programming in ANSI C (TMH)
2. Kamthane: Programming with ANSI and TURBO C (Pearson Education)
3. V. Rajaraman: Programming in C (PHI –EEE)
4. S. Byron Gottfried: Programming with C (TMH)
5. Yashwant Kanitkar: Let us C

C Programming Concepts [OEC]

Blueprint

Duration: 2 Hours

Max. Marks: 60

Sl.No	Units	No.of questions for 2 Marks	No.of questions for 4 Marks	No.of questions for 8 Marks	Total Marks
1	Unit 1: Introduction to C Programming:	2	2	2	28
2	Unit 2: Input and output with C	2	2	2	28
3	Unit3: Control Structures	2	2	2	28
4	Unit4: Strings	2	2	2	28
Total Number of Questions		8	8	8	112

K.L.E. Society's
Raja Lakhamagouda Science Institute (Autonomous),
Belagavi National Education Policy (NEP) 2021-2022
Department of Computer Science
B.Sc. I Semester

Course Code: 21CS111

Course Title: Digital Fluency [SEC]

Total Credits: 2

S.NO	Content	Details of Topic	Duration
1	Registration	Future Skills Course Registration Process	
2	Module 1: Emerging Technologies	Overview of Emerging Technologies: i. Artificial Intelligence, Machine Learning, Deep Learning, ii. Database Management for Data Science, Big Data Analytics, iii. Internet of Things (IoT) and Industrial Internet of Things (IIoT) iv. Cloud computing and its service models v. Cyber Security and Types of cyber attack	05 Theory hours and 10 practical hours
3	Module 2: Applications of Emerging Technologies	Applications of emerging technologies: i. Artificial Intelligence ii. Big Data Analytics iii. Internet of Things iv. Cloud Computing v. Cyber Security	05 Theory hours and 10 practical hours
4	Module 3: Applications of Emerging Technologies	Importance of the following: i. Effective Communication Skills ii. Creative Problem Solving & Critical Thinking iii. Collaboration and Teamwork Skills iv. Innovation & Design Thinking iv. Use of tools in enhancing skills	05 Theory hours and 10 practical hours

Digital Fluency [SEC]

Blueprint

Duration: 1 Hours

Max. Marks: 25

Sl.No	Units	No. of questions for 1 Marks	No. of questions for 2 Marks	No. of questions for 05 Marks	Total Marks
1	Module 1: Emerging Technologies	2	3	1	13
2	Module 2: Applications of Emerging Technologies	2	3	1	13
3	Module 2: Applications of Emerging Technologies	1	2	1	10
Total Number of Questions		5	8	3	36

NEP II sem

Course Title: Data Structures using C [DSC]

Course	Outcome
Introduction to data structures	CO1: Data structure introduction, recursion, arrays.
Sorting	CO2: Learning techniques of sorting and searching.
Queues	CO3: Learning Definition and Representation of queues, Types of queues, Introduction to Linked List.
Trees	CO4: Learning about trees.

Practical (Data Structures using C) [DSC]

CO1: Generate n Fibonacci numbers using recursive function

CO2: Implement Towers of Hanoi

CO3: Implement dynamic array, find smallest and largest element of the array

CO4: Create a file to store student records.

CO5: Read the names of cities and arrange them alphabetically.

CO6: Sort the given list using selection sort technique.

CO7: Sort the given list using quick sort technique.

CO8: Sort the given list using merge sort technique

CO9: Search an element using linear search technique

CO10: Search an element using recursive binary search technique

CO11: Implement Stack.

CO12: Convert an infix expression to postfix

CO13: Implement simple queue.

CO14: Implement linear linked list.

CO15: Display traversal of a tree.

Course Title: Web Designing [OEC]

Course	Outcome
Introduction	CO1: Gaining knowledge about world wide web, web designing, web programming.
Introduction to XHTML	CO2: Learning all the basic tags of XHTML.
JavaScript	CO3: Introduction to javascript. Control statements, arrays.
Introduction to XML	CO4: Gaining knowledge about XML, CSS, Web design.

K.L.E. Society's
Raja Lakhamagouda Science Institute (Autonomous), Belagavi
National Education Policy (NEP) 2021-2022
Department of Computer Science
B.Sc. II Semester

Course Code: 21CS201

Course Title: Data Structures using C [DSC]

Total Credits: 4

Unit	Contents	Hours
I	<p>Introduction to data structures: Definition; Types of data structures - Primitive & Non-primitive, Linear and Non-linear; Operations on data structures. Algorithm Specification, Performance Analysis, Performance Measurement</p> <p>Recursion: Definition; Types of recursions; Recursion Technique Examples - Fibonacci numbers, GCD, Binomial coefficient nC_r, Towers of Hanoi; Comparison between iterative and recursive functions. Arrays: Basic Concepts – Definition, Declaration, Initialisation, Operations on arrays; Types of arrays; Arrays as abstract data types (ADT); Representation of Linear Arrays in memory; Traversing linear arrays; Inserting and deleting elements;</p>	14
II	<p>Sorting–Selection sort, Bubble sort, Quick sort, Selection sort, Insertion sort;</p> <p>Searching - Sequential Search, Binary search; Iterative and Recursive searching; 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;</p>	14
III	<p>Queues: Basic Concepts – Definition and Representation of queues; Types of queues – Simple queues, Circular queues, Double ended queues, Priority queues; Operations on Simple queues; Dynamic memory allocation: Static & Dynamic memory allocation; Memory allocation and de- allocation functions - malloc, calloc, realloc and free.</p> <p>Linked list: Basic Concepts – Definition and Representation of linked list, Types of linked lists - Singly linked list, Doubly linked list, Header linked list, Circular linked list; Representation of Linked list in Memory; Operations on Singly linked lists – Traversing, Searching, Insertion, Deletion; Memory allocation; Garbage collection</p>	14

IV	<p>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;</p> <p>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; <i>preorder</i>, <i>inorder</i> and <i>Postorder</i> traversal; Reconstruction of a binary tree when any two of the traversals are given.</p>	14
TOTAL		56

Text Books:

1. Kottur: Data Structure Using C
2. Padma Reddy: Data Structure Using C

References:

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

Data Structures using C

Blueprint

Duration: 2 Hours

Max. Marks: 60

Sl.No	Units	No.of questions for 2 Marks	No.of questions for 4 Marks	No.of questions for 8 Marks	Total Marks
1	Unit 1: Introduction to data structures	2	2	2	28
2	Unit 2: Sorting & Searching	2	2	2	28
3	Unit3: Queues: Basic Concepts	2	2	2	28
4	Unit4: Trees	2	2	2	28
Total Number of Questions		8	8	8	112

Course Code: 21CS102

Practical (Data Structures using C) [DSC]

Total credits: 2

Lab Programs:

Duration of each practical: 4 Hours

1. Write a C Program to generate n Fibonacci numbers using recursive function.
2. Write a C Program to implement Towers of Hanoi.
3. Write a C Program to implement dynamic array, find smallest and largest element of the array
4. Write a C Program to create a file to store student records.
5. Write a C Program to read the names of cities and arrange them alphabetically.
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 quick sort technique.
8. Write a C Program to sort the given list using merge sort technique.
9. Write a C Program to search an element using linear search technique.
10. Write a C Program to search an element using recursive binary search technique.
11. Write a C Program to implement Stack.
12. Write a C Program to convert an infix expression to postfix.
13. Write a C Program to implement simple queue.
14. Write a C Program to implement linear linked list.
15. Write a C Program to display traversal of a tree.

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program – 1	Writing the Program	04
	Execution and Formatting	04
Program -2	Writing the Program	04
	Execution and Formatting	04
Viva Voice		04
Journal		05

Total	25
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K.L.E. Society's
Raja Lakhamagouda Science Institute (Autonomous), Belagavi
National Education Policy (NEP) 2021-2022
Department of Computer Science
B.Sc. II Semester

Course Title: Web Designing [OEC]

Total Credits: 3

Units	Contents	Hours
I	<p>Introduction: Histry of Internet, The World Wide Web, Web Browser, Web Server, URL, Working of Web, Web Page, Types of Web Pages, Web Content, Websites, Home Pages, Building Website, Website building tools;</p> <p>Web graphics design, basic tips for graphics design, Web Designing tools: Gimp-image resize, crop, edit background, save with different file types. Introduction to web programming: what is web programming? , web programming languages.</p>	10
II	<p>Introduction to XHTML- Basic Syntax, Standard structure, Basic text markup, Images, Hypertext, Links, Lists, Tables, Forms-<form>,<input>,<label>,<select>,<textarea> tags and action buttons(submit and reset). CSS- Introduction, Levels of style sheets, Selector forms, Property value forms, Font properties, List properties, Color, Alignment of text, The box model, Background images, The and <div>tags.</p>	12
III	<p>JavaScript: Object orientation and JavaScript; General syntactic characteristics; Primitives, operations, and expressions; Screen output and keyboard input; Control statements; Object creation and modification; Arrays; Functions; Constructor; Pattern matching using regular expressions; Errorsin scripts; Examples.</p>	10
IV	<p>Introduction to XML, Syntax of XML, XML document structure, Displaying raw XML documents, Displaying XML documents with CSS, XSLT Stylesheets and Displaying XML documents with XSLT.</p> <p>Web Design: Concepts of effective web design, Web design issues including Browser, Bandwidth and Cache, Display resolution, Look and Feel of the Website, Page Layout and linking, User centric design, Sitemap, Planning and publishing website, Designing effective navigation</p>	10
TOTAL		42

Text Books:

1. Robert W. Sebestra, "Programming the World Wide Web", 7th Edition /4thedition Addison Wesley Publication, 2013.

Reference Books:

1. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
2. Web Technologies, Black Book, dreamtech Press
3. HTML 5, Black Book, dreamtech Press
4. Web Design, Joel Sklar, Cengage Learning
5. Developing Web Applications in PHP and AJAX, Harwani, McGrawHill
6. Internet and World Wide Web How to program, P.J. Deitel& H.M. Deitel, Pearson.

Web Designing

Blueprint

Duration: 2 Hours

Max. Marks: 60

Sl.No	Units	No.of questions for 2 Marks	No.of questions for 4 Marks	No.of questions for 8 Marks	Total Marks
1	Unit 1: Introduction	2	2	2	28
2	Unit 2: Introduction to XHTML	2	2	2	28
3	Unit3: JavaScript	2	2	2	28
4	Unit4: Introduction to XML	2	2	2	28
Total Number of Questions		8	8	8	112

Theory Examination Question Paper Model (DSC & OEC)

Theory Examination Question Paper Model

Question 1	Consists of 8 questions of 2 marks each and student must answer any 6	$6 \times 2 = 12$
Question 2	Consists of 2 main questions with sub questions a) and b) of 8 and 4 marks respectively. students must answer any 1	$8 + 4 = 12$
Question 3	Consists of 2 main questions with sub questions a) and b) of 8 and 4 marks respectively. students must answer any 1	$8 + 4 = 12$
Question 4	Consists of 2 main questions with sub questions a) and b) of 8 and 4 marks respectively. students must answer any 1	$8 + 4 = 12$
Question 5	Consists of 2 main questions with sub questions a) and b) of 8 and 4 marks respectively. students must answer any 1	$8 + 4 = 12$

(SEC)

Internal Examination	
Duration	30 min
Frequency	2 per semester
Average of two tests	10 Marks
Practical Assignment	15 Marks
Total	25 Marks
Theory Examination	
Section A: Multiple choice questions (Answer all 5 questions)	5 questions x 1 mark = 5 marks
Section B: Answer any 5 (out of 8 sub questions) marks (Three questions from module 1, Three questions from module 2, Two questions from module 3) short answers	5 questions x 2 mark = 10 marks
Section C: Answer any 2 (out of 3 sub questions) (Fill in the blanks, match the following, True or false etc. (one question from each module	2 questions x 5 mark = 10 marks
Total	25 Marks