



Computer Science Paper I
Advanced 'C'
[CORE COURSE]

Semester – II	Credits: 2	Subject Code: BS22001	Lectures: 40
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Course Outcomes:
At the end of this course, the learner will be able to:
<ul style="list-style-type: none"> • Construct the code organization with complex data types, structures and preprocessor directives. • Write programming code for files manipulation. • Recognize the advanced concepts of programming using the 'C' language.

Unit 1: Arrays and Pointers	14
<ul style="list-style-type: none"> • Chapter 1: Arrays <ul style="list-style-type: none"> ○ Array declaration, initialization ○ Types – one, two and multidimensional ○ Array Operations - declaration, initialization, accessing array elements. ○ Memory representation of two-dimensional array (row and column major) ○ Passing arrays to function. ○ Array applications - Finding maximum and minimum (using brute force method), Counting occurrences, Linear search, ○ Sorting an array (Simple exchange sort, bubble sort), Merging two sorted arrays, Matrix operations (trace of matrix, addition transpose, multiplication, symmetric, upper/ lower triangular matrix) • Chapter 2 : Pointers <ul style="list-style-type: none"> ○ Pointer declaration, initialization ○ Dereferencing pointers ○ Pointer arithmetic ○ Pointers to array ○ Functions and pointers-passing pointers to functions(call by reference), function returning pointers ○ Dynamic memory allocation ○ Pointer to pointer 	<p>6</p> <p>8</p>

Unit 2: Strings	8
<ul style="list-style-type: none"> • Chapter 3: Strings <ul style="list-style-type: none"> ○ Declaration and initialization. Format specifiers ○ Standard library functions ○ Strings pointers ○ Array of strings ○ Command line arguments 	8

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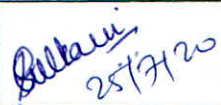
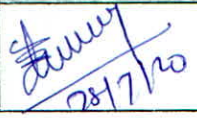
Unit 3: Structures and Unions	8
<ul style="list-style-type: none">• Chapter 4: Structures and Unions<ul style="list-style-type: none">○ Creating structures○ Accessing structure members (dot Operator)○ Structure initialization○ Array of structures○ Passing structures to functions○ Nested structures○ Pointers and structures○ Unions○ Difference between structures and unions○ To implement function using structure, pointer and structure	8
Unit 4: Files and Preprocessor	10
<ul style="list-style-type: none">• Chapter 5: File Handling<ul style="list-style-type: none">○ Introduction to Streams○ Types of Files○ Operations on files○ Standard library input/output functions.○ Random access to files.	8
<ul style="list-style-type: none">• Chapter 6 : C Preprocessor<ul style="list-style-type: none">○ Format of Preprocessor directive○ File Inclusion directive and conditional directives○ Macro substitution, nested macro, argumented macro○ Macros versus functions	2

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Recommended Books:

- Ajay Mitta, *Programming in C, A Practical Approach*, 1, Pearson
- Behrouz A. Forouzan, Richard F. Gilberg, *A Structured Programming Approach Using C*, Cengage Learning India
- Brian Kernighan, Dennis Ritchie, *The 'C' programming language*, PHI
- B. Gottfried, *Programming with C*, 3rd edition, Schaum's outline Series, Tata McGraw Hill.
- E. Balagurusam, *Programming in ANSI C*, 7th Edition, McGraw Hill.
- Schildt Herbert, *C: the Complete Reference*, 4th edition, McGraw Hill.

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