

ACHARYA NAGARJUNA UNIVERSITY  
DEPARTMENT OF MATHEMATICS  
SEMESTER-II (w.e.f.batch2011-2013)  
M.204 –COMPUTER ORIENTED NUMERICAL METHODS

**UNIT – I**

**C – Basics**

C – character set

Data types

Variables

Constants

Expressions

Structure of C program

Operators and their precedence and Associativity

Basic input and output statements

Control structures

Simple programs in c using all the operators and control structures

**Functions**

Concept of a function

Parameters and how they are passed

Automatic Variables

Recursion

Scope and extent of variables

Writing programs using recursive and non – recursive functions

( 1.4,1.7,1.11,1.12 of Chapter 1, 2.2,2.3,2.4 of Chapter 2 , 3.1,3.2,3.3 of Chapter 3 & 5.1,5.2,5.3 of Chapter 5 of [1] )

**UNIT – II**

**Arrays and Strings**

Single and multidimensional Arrays

Character array as a string

Functions on strings, Writing C Programs using arrays and for string manipulation.

**Pointers**

Pointers declarations

Pointers expressions

Pointers as parameters to functions

Pointers and Arrays

Pointer arithmetic

### **Structures & Unions**

Declaring and using structures  
Operations on structures  
Arrays of structures  
User defined data types  
Pointers to Structures

### **Files**

Introduction  
File structure  
File handling functions  
File types  
File error handling  
C programming examples for using files

(4.1 to 4.6 of Chapter 4, 6.1 to 6.8 of Chapter 6 , Chapter 9 & Chapter 10 of [1] )

### **UNIT-III**

Interpolation and Approximation : Lagrange and Newton Interpolations,  
Finite difference Operators , Interpolating polynomials using finite differences, Hermite  
interpolations.

(Section 4.1 to 4.5 of [2] ).

### **UNIT-IV**

Numerical Differentiation and Integration: Methods based on interpolation , Methods based On  
Undetermined Coefficients , Composite Integration Methods,  
Ordinary Differential Equations: Introduction, Difference Equations,  
Numerical Methods, Single step Methods.  
(Sections 5.7, 5.8, 5.9 of [2]) & (Sections 6.1 to 6.4 of [2]).

### **TEXT BOOKS:**

- [1] C Programming A Practical approach  
By Ajay Mittal, Publishers – Pearson Edition.  
[2] Numerical Methods for Scientific and Engineering Computation  
by  
M.K.Jain S.R.K. Iyengar and R.K. Jain, Third edition,  
New Age International (p) Limited, New Delhi ,1997.