TECNIA INSTITUTE OF ADVANCED STUDIES

Grade 'A' Institute

Department of Information, Communication & Technology

Master Of Computer Applications (MCA)

Scheme and Syllabus (w.e.f. Academic Session 2020-21 onwards)

Course Code: MCA-247 **L T C**
Course Name: Numerical and Scientific Computing **3 1 4**

LEARNING OBJECTIVES

In this course, the learners will be able to develop expertise related to following: -
1. Overview of some of the issues and problems that arise in scientific computation, such as (non-)linear systems, numerical and symbolic integration, differential equation and simulation.
2. Suitable and effective methods called Numerical Methods, for obtaining approximate representative numerical results of the problems.
3. Problems in the field of Applied Mathematics, Theoretical Physics and Engineering which requires computing of numerical results using certain raw data.
4. To solve complex mathematical problems using only simple arithmetic operations. The approach involves formulation of mathematical models of physical situations that can be solved with arithmetic operations.
5. To deal with various topics like finding roots of equations, solving systems of linear algebraic equations, interpolation and regression analysis, numerical integration & differentiation, solution of differential equation, boundary value problems, solution of matrix problems.

PRE-REQUISITES

1. Basic of Mathematics.

2. COURSE OUTCOMES (COs)

After completion of this course, the learners will be able to:

CO#	Detailed Statement of the CO	BT Level	Mapping to PO #
CO1	Recall finite precision computation.	BTL1	PO1
CO2	Demonstrate understanding of common numerical methods used to obtain approximate solutions to otherwise intractable mathematical problems.	BTL2	PO1, PO2
CO3	Apply Numerical analysis which has enormous applications in the field of Science and some fields of Engineering.	BTL3	PO1, PO2, PO3,
CO4	Examine numerical methods for various mathematical operations and tasks.	BTL4	PO1, PO2, PO3, PO4, PO5
CO5	Analyze and evaluate the accuracy of common numerical methods.	BTL5	PO1, PO2, PO3, PO4, PO5, PO6, PO10
CO6	Assess calculation and interpretation of errors in numerical method.	BTL5	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11