

Department of Mathematics and Computing
IIT(ISM) Dhanbad
Lecture Plan

Date:30/05/2022

Semester Winter		II-B.Tech(Common)	Session 2021-2022			
Course Type	Course Code	Name of Course	L	T	P	Credit
IC	MCI103	Numerical Methods (Modular)	2	2	0	7
Course Objective						
The objective of the course is to provide basic knowledge of numerical methods to solve mathematical problems arising in Engineering and Science which can not be solved by analytic methods.						
Learning Outcomes						
Upon successful completion of this course, students will: <ul style="list-style-type: none"> • get knowledge to solve linear system of equations • be able to understand interpolation, numerical differential and integration • be able to solve differential equations numerically 						
Unit No.	Topics to be Covered		Lecture Hours	Learning Outcome		
1	Numerical solution of system of linear equations (Gaussian Elimination Method, Gauss Jordan Method, Crout's Triangularization Method, Jacobi method, Gauss-Seidel method).		3	This unit will help student in understanding Numerical solution of system of linear equations		
2	Interpolation (Newton- Gregory forward and backward formula, Lagrange's interpolation).		3	Be able to perform Interpolation		
3	Numerical differentiation (Newton forward and Backward Formula), Numerical integration (Trapezoidal rule, Simpson's 1/3 rd rule, Simpson's 3/8 th rule).		3	Be able to understand Numerical differentiation and Numerical integration		
4	Numerical Solution of first order ordinary differential equations (Taylor series method, Euler's method, Modified Euler's method, Runge -Kutta Method), Numerical solution of Partial Differential equation by finite difference method.		4	To understand numerical methods for solving first order Ordinary Differential Equations and Partial Differential equations		

Text Book: Gerald C. F. and Wheatley P. O. Applied Numerical Analysis-7 th Edition. Pearson, 2007.

Reference Books:

- Grewal B. S. Numerical Methods in Engineering & Science (with Programs in C,C++ & MATLAB). Khanna Publications 2014.
- Jain and Iyengar. Numerical Methods for Scientific and Engineering Computation. New Age International Publications, 2012.
- Sastry S.S. Introductory Methods of Numerical Analysis. PHI Publications 2013.

Note: 1. First Quiz (20 Marks) on June 21, 2022 at 6:30PM, **Second** Quiz (20 Marks) on July 5,2022 at 6:30PM
2. End semester Exam of 60 Marks

(S. Gupta)

(Badam Singh Kushvah)

(R. Kaligatala)

(Ruchika Sehgal)