

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme		Bachelor of Technology			Branch/Spec.		Petrochemical Engineering		
Semester		III			Version		1.0.0.0		
Effective from Academic Year			2020-21		Effective form the batch Admitted in			July 2019	
Subject code		2PCE3101		Subject Name		Numerical Methods And Programming			
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	1	1	0	5	Theory	40	60	100
Hours	3	1	2	0	6	Practical	30	20	50
Pre-requisites:									
<ul style="list-style-type: none"> • Basics of Computer • Basic Mathematics 									
Course Objective									
After learning this course, student should be able to:									
<ul style="list-style-type: none"> • Students need to learn programming languages and algorithm. • Understand the concepts of array and matrix operations in C. • To learn polynomial equations. • To learn Numerical Integral and Differential equations • To understand optimization techniques. 									
Theory syllabus									
Unit	Content								Hrs
1	Introduction to programming: programming languages, algorithm, flowcharts, C Language: Features of C, data types, Identifiers, Constants, Variables, expressions, Console I/O statement, Selection statements: if-else, switch, Iteration Statements: For, while, do-while, Jump statements: return, go to, break, and continue, comments, and program using these features.								11
2	Macros Function and Recursion: Structure and Union, Pointers, String, Basics of File handling								6
3	Concept of Array, Matrix operations in C and Searching, Sorting: Linear search, Binary search, Bubble sort, Insertion sort, Selection Sort.								6
4	Program to obtain roots of polynomial Equation: Newton-Rapson method, Regular Falsi Method, Muller method, Bisection method, false position method. Programs for interpolation and extrapolation using numerical methods.								8
5	Numerical Integral and Differential equations using: Initial value problems by Euler's method, modified Euler's, Taylor series, Runge-kutta methods, Regression analysis.								8
6	Optimization techniques: integer programming, Simplex method, dynamic programming, programs for implementation of these method and case study.								6
Practical content									
Practical list shall be based on the above content of subject									
Text Books									
1	Numerical methods for Scientific and Engg. Computations by M.K. Jain, Srk Iyengar, R.K. Jain, Wiley Eastern Ltd.								

2	Numerical methods for Science & Engg. By Stanton R.G., PHI.
Reference Books	
1	The C Programming Language: Dennis Ritchie & Brain Kernighan [Pearson].
2	ANSI C: By E Balagurusamy
ICT/MOOCs references	
<u>1</u>	https://nptel.ac.in/courses/122106033/
<u>2</u>	https://www.math.unipd.it/~mrrusso/Didattica/NA-Yaounde/Manual.pdf
<u>3</u>	https://www.youtube.com/playlist?list=PLCA944605A8EDE42A
Course Outcomes	
<p>Students will learn programming languages and algorithm.</p> <p>Understand the concepts of array and matrix operations in C.</p> <p>Know about polynomial equations.</p> <p>Students will learn Numerical Integral and Differential equations</p> <p>Students will understand optimization techniques.</p>	