C. U. SHAH UNIVERSITY, WADHWAN CITY.

Faculty of: **Sciences and Life Sciences**
Course: **Bachelor of Science (Chemistry)**
Semester**: II**
Subject Code**: MAE202-1C**
Subject Name: **Basic Mathematics II**

Sr. No	Category	Subject Code	Subject Name	Teaching hours/ Week Th	Tu	Pr	Credit hours	Credit Points	Theory Continuous and Comprehensive Evaluation Marks	Marks	End Semester Exams Marks	Duration	Tutorial / Practical Internal Assessment Marks	Duration	End Semester Exams Marks	Duration	Total
3	MINOR	MAE202-1C	Basic Mathematics II	3	-	2	5	4	10 10 05	Assignment Quiz Attendance	50	2	25	1	-	-	100

AIM

The main objectives of this course are

- Use finite differences for interpolation, differentiation, etc.
- Methods to solve system of linear equations.
- Methods to solve differential equations.

COURSE CONTENTS

Course Outline for Theory

UNIT	COURSE CONTENT	TEACHING HOURS
I	Curve Tracing in Cartesian Coordinates using Symmetry, Intercepts, Asymptotes and Sign of the Function, Curve Tracing in Parametric Equations using Intercepts, Tangents parallel to axes, Asymptotes parallel to the axes, Oblique Asymptotes and Extent to the Curve; Equations of Tangent and Normal to the Curve at a given point.	15
II	First order and First-degree differential equations: basic concepts, Homogeneous and non-Homogeneous Equations, Exact differential equations, Integrating factors, Linear differential equations, Bernoulli equations, Differential equations of the first order and higher degree: Solvable for p, for x and for y, Clairaut's form of differential equations and Lagrange's form of differential equations.	15
III	Error in calculation and calculus of finite differences, interpolation. Significant error, Relative error, Estimation of error, Application of error formula. Forward differences, Backward differences, Shift operator, Polynomial in factorial notation.	15

Course Outline for Practical

SR. NO	COURSE CONTENT
1	Problems based on errors

2	Sketching of Cartesian curve, Parametric curves, Polar curves and reciprocal curves
3	Relation between Cartesian, polar, spherical and cylindrical coordinates.
4	Problems on solution of ODE of order 1 and degree 1-I (Separable variables, homogeneous and non-homogeneous)
5	Problems on solution of ODE of order 1 and degree 1-II (Linear, Bernoulli and exact ODE)
6	Problems on solution of ODE of order 1 and degree n
	Total Hours = 30

TEACHING METHODOLOGY

Conventional method (classroom blackboard teaching)

ICT Techniques

Teaching through the classroom

Variety of learning styles and tools (PowerPoint presentations, audio-visual resources, e-resources, seminars, workshops, models)

LEARNING OUTCOME

After the successful completion of the course, students will be able to

- Analyse errors and have an understanding of error estimation.
- Graphing and optimization of the functions.
- Imagine three dimensional objects virtually.
- Analyse differential equations.
- Solve first ODES.

ARRANGEMENT OF LECTURE DURATION AND PRACTICAL SESSION AS PER DEFINED CREDIT NUMBERS

Units	Lecture Duration (In Hrs.)		Calculation of Credits (In Numbers)		Total Lecture Duration	Credit Calculation
	Theory	**Practical**	**Theory**	**Practical**	**Theory+ Practical**	**Theory+ Practical**
Unit – 1	15					
Unit – 2	15	30	3	1	45+30	4
Unit – 3	15					
TOTAL	**45**	**30**	**3**	**1**	**75**	**4**

EVALUATION

Theory Marks	Practical Marks	Total Marks
75	25	100

REFERENCE BOOKS

1. Numerical Analysis and Computational Procedures', **S. A. Moolah,** *New Central Book Agency (P) Ltd., Calcutta.*
2. 'Elementary Numerical analysis', **S. S. Sastry,** *Prentice Hall, New Delhi.*
3. Analytical solid Geometry', **Shanti Narayan and P. K. Mittal**, *S. Chand and Co.* New Delhi.
4. 'Differential Calculus', **Shanti Narayan and P. K. Mittal**, *S. Chand and Co.* New Delhi.
5. Higher Engineering Mathematics, Thirty-fifth edition', **B. S. Grewal**, *Khanna Publication.*