DEPARTMENT OF APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCE

B.PHARM. I YEAR II SEMESTER

MA 1Y 004: REMEDIAL MATHEMATICS

HOURS PER WEEK			CREDITS			MAXIMUM MARKS				
T	P	TU	T	P	TU	THEORY		PRACTICAL		TOTAL MARKS
						CW	END SEM	SW	END SEM	
3	--	-	2	--		15	35	--	--	50

PRE – REQUISITES: Basic knowledge of Mathematics of class 10th.

COURSE OBJECTIVES

This is an introductory course of mathematics. This subject deals with the introduction to Partial fraction, Logarithm, matrices and determinant, analytical geometry, calculus, differential equation and laplace transform.

COURSE OUTCOMES

On completion of this course, students are able to

CO#1 impart understanding of fundamental aspects of mathematics having applications in mathematical expressions encountered in various subjects of B. Pharm. degree course.

CO#2 provide basic knowledge of Partial fraction, Logarithm, matrices and Determinant, Analytical geometry, Calculus, differential equation and Laplace transform.

CO#3 develop the ability to solve different types of numerical problems.

COURSE CONTENTS

THEORY

UNIT 1

a) Partial fraction: Introduction, Polynomial, Rational fractions, Proper and Improper fractions, Partial fraction, Resolving into Partial fraction, Application of Partial Fraction in Chemical Kinetics and Pharmacokinetics.

b) Logarithms: Introduction, Definition, Theorems/Properties of logarithms, Common logarithms, Characteristic and Mantissa, worked examples, application of logarithm to solve pharmaceutical problems.

c) Function: Real Valued function, Classification of real valued functions.

d) Limits and continuity : Introduction, Limit of a function, Definition of limit of a function (Є – δ definition)

$\lim_{x\to a}\frac{x^n-a^n}{x-a} = na^{n-1}$, $\lim_{\theta\to 0}\frac{\sin\theta}{\theta} = 1$

UNIT 2 **Matrices and Determinant**: Introduction matrices, Types of matrices, Operation on matrices, Transpose of a matrix, Matrix Multiplication, Determinants, Properties of determinants , Product of determinants, Minors and co-factors, Adjoint or adjugate of a square matrix, Singular and non-singular matrices, Inverse of a matrix, Solution of system of linear of equations using matrix method, Cramer's rule, Characteristic equation and roots of a square matrix, Cayley – Hamilton theorem, Application of Matrices in solving Pharmacokinetic equations.

UNIT 3 **Calculus** : Differentiation : Introductions, Derivative of a function, Derivative of a constant, Derivative of a product of a constant and a function , Derivative of the sum or difference of two functions, Derivative of the product of two functions (product formula), Derivative of the quotient of two functions (Quotient formula) – Without Proof, Derivative of x^n *w.r.t.* x, where *n* is any rational number, Derivative of e^x,, Derivative of $\log_e x$, Derivative of a^x, Derivative of trigonometric functions from first principles (Without Proof), Successive Differentiation, Conditions for a function to be a maximum or a minimum at a point. Applications.

UNIT 4 **Analytical Geometry**: Introduction: Signs of the Coordinates, Distance formula,
Straight Line : Slope or gradient of a straight line, Conditions for parallelism and perpendicularity of two lines, Slope of a line joining two points, Slope – intercept form of a straight line
Integration: Introduction, Definition, Standard formulae, Rules of integration, Method of substitution, Method of Partial fractions, Integration by parts, definite integrals. Applications.

UNIT 5 **Differential Equations**: Some basic definitions, Order and degree, Equations in separable form, Homogeneous equations, Linear Differential equations, Exact equations, Application in solving Pharmacokinetic equations.

a) Laplace Transform : Introduction, Definition, Properties of Laplace transform, Laplace Transforms of elementary functions, Inverse Laplace transforms, Laplace transform of derivatives, Application to solve Linear differential equations, Application in solving Chemical kinetics and Pharmacokinetics equations.

ASSESSMENT

1. Internal Assessment for continuous evaluation, mid-term tests, tutorials, class performance, etc. (30%).
2. End semester Theory Exam (70%)

TEXT BOOKS RECOMMENDED

1. Kachot, K.R., Advanced Mathematics for Pharmacy, Maharja Publishing House, Ahemdabad.
2. Bale, N.P., A textbook of Pharmaceutical Mathematics (Advanced Mathematics Volume-I).
3. Remedial Mathematics (Advanced Mathematics Volume-I).

REFERENCE BOOKS

1. Dr. B. S. Grewal, Higher Engineering Mathematics.
2. PanchaksharappaGowda D.H., Pharmaceutical Mathematics with application to Pharmacy.
3. Das H. K, Higher Engineering Mathematics, S. Chand New Delhi, 2011.