Department of Pharmaceutical Sciences
B. Pharm.

Remedial Mathematics

Course Code: BP106RMT **L-T-P-C: 2-0-0-2**

Course Outcomes: At the end of this course, the students are expected to:

CO 1	demonstrate the theory and their application in Pharmacy
CO 2	solve the different types of problem by applying theory.
CO 3	appraise the important application of mathematics in Pharmacy
CO 4	outline the Partial fraction, Logarithm, Matrices and Determinant, Analytical geometry
CO 5	estimate, differential equation and Laplace transform

UNIT-I

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

Logarithms

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

Function

Real Valued function, Classification of real valued functions,

Limits and continuity

Introduction, Limit of a function, Definition of limit of a function ($\in -\delta$ 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 -II

Matrices and Determinant: Operation on matrices, Introduction matrices, Types of matrices, Transpose of a matrix, Matrix Multiplication, Determinants, Properties of determinants, Product of determinants, Minors and co-Factors, Adjoint 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 – III 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. to x, where n is any rational number, Derivative of e., Derivative of log, x. Derivative of a 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. Application

UNIT – IV 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, points, Slope intercept form of a straight-line Integration:

Slope of a line joining two, Introduction, Definition, Standard formulae, Rules of integration, Method of substitution, Method of Partial fractions, Integration by parts, definite integrals, application

UNIT-V

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

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

Textbooks

1. Differential Calculus by Shanthi Narayan
2. Integral Calculus by Shanthi Narayan
3. Higher Engineering Mathematics by Dr. B. S. Grewal

Reference Book

1. Pharmaceutical Mathematics with application to Pharmacy by Panchak Harappa Gowda D.H.