K.T.S.P.Mandal's
Hutatma Rajguru Mahavidyalaya, Rajgurunagar
Department of Mathematics
Teaching Plan
Academic Year-2023-24
Sem-II

Sr. No.	Class	Subject	Name of Teacher
1	F.Y.B.Sc.	Analytical Geometry	Prof. Toke R. N.
		Calculus-II	Prof. Wayal R.M.
2	S.Y.B.Sc.	Linear Algebra	Prof. Wayal R.M.
		Vector Calculus	Prof. Wayal R.M.
3	F.Y.B.Com	Business Mathematics & Statistics	Prof. Toke R. N.

Class - F.Y.B.Sc.   **Subject:- Analytical Geometry**

Name:-Prof. Toke R. N.   **No. of lectures per week - 03**

Month	Topic
December	Equation of plane , normal form ,transform to the normal form , plane passing through three non-linear points ,intercept form ,angle between two planes , Distance of a point from plane ,distance between parallel planes, system of planes, two sides of planes ,bisector of planes, Equation of a line in symmetric
January	Equation of a sphere in different forms, plane section of a sphere Equation of a circle, sphere through a given circle ,intersection of sphere and a line , equation of tangent plane to sphere
February	Unsymmetrical forms, line passing through two points, angle between a line and a plane, perpendicular distance of a point from a plane, condition for two lines to be coplanar
March	Change of axes Translation and Rotation. Conic Section: general equation of second degree in two variables. Centre of conic ,nature of conic. Reduction of conic to standard form. Direction cosines and direction ratios,

Class - F.Y.B.Sc.   **Subject: Calculus -II**

Name:-Prof. Wayal R. M.   **No. of lectures per week - 03**

Month	Topic
December	The Derivatives, Definition of the derivative of a function at a point, every differentiable function is continuous, Rules of differentiation, Caratheodary's theorem The chain rule, Derivative of inverse function. The Mean Value Theorems, Interior extremum theorem, Mean Value theorems and their Consequences, Intervals of increasing and decreasing of a function,first derivative test for extrema. Derivative of inverse function The Mean Value Theorems. Interior extremum theorem, Mean Value theorems and their Consequences, Intervals of increasing and decreasing of a function,first derivative test for extrema.L'Hospital Rule, Indeterminate forms, L'Hospital Rules
January	Taylor's theorem and Maclaurin'stheorem with Lagrange's form of remainder, The nth derivative and Leibnitz theorem for successive differentiation Separable equations. Existence and Uniqueness of solutions of nonlinear equations. The nth derivative and Leibnitz theorem for successive differentiation. Separable equations.
February	Existence and Uniqueness of solutions of nonlinear equations Linear first order equations. Transformation of nonlinear equations to separable equations. Exact differential equations, Integrating factors.

Class: S.Y.B.Sc.   **Subject: Linear Algebra**

Name: Prof. Wayal R. M.   **No. of lectures per week-03**

Month	Topic
January	Row echelon form and reduced row echelon form of a matrix,
February	Consistency of homogeneous and non-homogeneous system of linear equations using rank, condition for consistency, Gauss elimination and Gauss-Jordan method. Vector spaces, subspaces.Linear dependence and independence, Dimension of a vector space, row, column and null space of a matrix.
March	Rank and nullity. Definition and example of a linear transformation, kernel and range of L. T., rank-nullity theorem, matrices.
April	linear transformation, linear isomorphism.

Class: S.Y.B.Sc. **Subject: Vector Calculus**

Name: Prof. Wayal R.M. **No. of lectures per week-03**

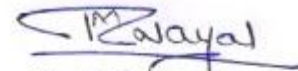| Month	Topic
February	Curves in Space, Limits and Continuity, Derivatives and Motion, Differentiation ,Rules for Vector Function, Vector Functions of Constant Length. Integrals of Vector Functions. Arc Length along a Space Curve, Speed on a Smooth Curve, Unit Tangent Vector. Curvature of a Plane Curve, Circle of Curvature for Plane Curves, Curvature and Normal Vectors for a Space Curve., Line Integral of Scalar Functions.
March	Additivity, Line integral in the Plane. Vector Fields, Gradient Fields, Line Integral of Vector Fields.Work done by a Force over a Curve in Space, Flow Integrals and Circulation for Velocity Fields, Flow across the Simple Closed Plane Curve. Path Independence, Conservative and Potential Functions. Divergence,
April	Two forms for Green's Theorem, Green's Theorem in the Plane. Parameterizations of Surfaces. Implicit surfaces, Surface integrals, Orientation of Surfaces. Surface Integrals of Vector Fields. The Curl Vector Field, Stokes' Theorem, Conservative Fields and Stokes' Theorem.

Class - F.Y.B.Com. **Subject:- Business Mathematics and Statistics-II**

Name:-Prof. Toke R. N. **No. of lectures per week:-04**

Month	Topics
December	Definition of a Matrix, Types of Matrices, Algebra of Matrices, Determinants, Adjoint of a Matrix, Inverse of a Matrix via Adjoint Matrix, Homogeneous System of Linear equations, Condition for Consistency of homogeneous system, Solution of Non-homogeneous System of Linear equations ,Applications in Business and Economics, Examples and Problems.
January	Concept of index number, price index number, price relatives. Problems in construction of index number. Construction of price index number: Weighted index Number, Laspeyre's, Paasche's and Fisher's method. Cost of living / Consumer price index number: Definition, problems in construction of index number. Methods of construction: Family budget and aggregate expenditure. Inflation, Uses of index numbers, commonly used index numbers. Examples and problems.
February	Definition and terms in a LPP, formulation of LPP, Solution by Graphical

	method, Examples and Problems.
March	Concept and types of correlation, Scatter diagram, Interpretation with respect to magnitude and direction of relationship. Karl Pearson's coefficient of correlation for ungrouped data. Spearman's rank correlation coefficient. Concept of regression, Lines of regression for ungrouped data, predictions using lines of regression. Regression coefficients and their properties. Examples and problems.

R. M. Wayal

Head

Department of Mathematics

Hutatma Rajguru

Mahavidyalaya, Rajgurunagar