

**BHARATHIAR UNIVERSITY :: COIMBATORE 641 046**  
**ALLIED PAPER MATHEMATICS FOR STATISTICS FOR B.Sc. STATISTICS – MAJOR**  
**(For the students admitted from the academic year 2016-2017 and onwards)**

**ALLIED SUBJECT: MATHEMATICS FOR STATISTICS – PAPER I**

**UNIT I: MATRICES AND DETERMINANTS**

**Definition** of matrices-order of matrix-types of matrices-matrix operations-addition, scalar multiplication, multiplication of matrices, transpose. Definition of Determinants and value of determinants of order 2 and 3-Adjoint and inverse of a matrix- Solution of system of simultaneous linear equations by using inversion of matrix and Cramers rule methods.

**UNIT II: SYSTEM OF LINEAR EQUATIONS**

Rank of a matrix- Rank through elementary transformations-consistency and inconsistency of system of simultaneous linear equations. Eigen values and Eigen vectors - Cayley Hamilton theorem(Statement only) and its verification.

**UNIT III:THEORY OF EQUATIONS**

Relation between roots and co-efficients -Reciprocal equations – Increase and decrease the roots of a given equations-Descart's rule of signs.

**UNIT IV: DIFFERENTIAL CALCLUS**

Limit of a function-continuity of a function-concept of differentiation- Differentiation techniques-product rule- quotient rule- chain rule. Second order derivatives.

**UNIT V : INTEGRAL CALCLUS**

Integration techniques: Integrals of  $f(x)$ ,  $f(ax+b)$ ,  $f(x)+g(x)$ . Method of substitution-  $f'(x)/f(x)$ ,  $f'(x)[f''(x)]$ ,  $1/(ax^2+bx+c)$ - Integration by parts. Definite integrals – Simple problems.

**TEXT BOOKS:**

1. Matrices by A.R. VASISHTA (Krishna Prakashan Mandir (P) Ltd. Meerut)
2. Classical Algebra by T.K.MANICAKAVACHAGOM PILLAI and others (S.Viswanathan printers and publishers Pvt. Ltd.)
3. CALCULUS by T.K.MANICAKAVACHAGOM PILLAI and others (S.Viswanathan printers and publishers Pvt. Ltd.)

**REFERENCES:**

1. Matrices by SHANTHI NARAYANAN (S.CHAND & CO)
2. Classical Algebra by KANDASAMY, THILAGAVATHY and others (S.Chand & Co)
3. CALCULUS by KANDASAMY, THILAGAVATHY and others (S.Chand & Co)

**B.Sc. STATISTICS – MAJOR**  
**ALLIED SUBJECT: MATHEMATICS FOR STATISTICS – PAPER II**  
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**UNIT I: ALGEBRA**

Binomial, Exponential and Logarithmic series- Problems related to summation only (Proof not required)

**UNIT II: PARTIAL DERIVATIVES AND PARTIAL DIFFERENTIAL EQUATIONS**

Partial derivatives – Euler’s theorem for homogeneous function – verification of Euler’s theorem. Formation of partial differential equations by eliminating arbitrary constants and arbitrary functions.

**UNIT III: ORDINARY DIFFERENTIAL EQUATIONS**

Solution of second order differential equations with constant coefficients with right hand side of the equation as  $e^{ax}$ ,  $\sin(ax)$  and  $\cos(ax)$ .

**UNIT IV: LAPLACE TRANSFORMS**

Laplace transforms – inverse Laplace transforms (excluding solution of ODEs)

**UNIT V: FOURIER SERIES**

Fourier series – Expansion of Fourier series of a function with period  $2\pi$  - Odd and Even functions- Half range Fourier series.

**TEXT BOOKS:**

1. P.Kandasamy & V.Thilagavathi – Mathematics for B.Sc. Vol.III S.Chand & Company Ltd. 2015
2. CALCULUS by KANDASAMY, THILAGAVATHY and others (S.Chand & Co)

**REFERENCES:**

1. Method of real analysis by Rd.R.GOLDENBERG(Oxford & IBM)
2. Principles of Mathematical Analysis by WALTER RUDIN (McGraw Hill Publishing)