

## ST2 C06 MULTIVARIATE DISTRIBUTIONS

### UNIT I

Bivariate normal distribution- marginal and conditional distributions, characteristic function. Bivariate exponential distribution of Marshall and Olkin - marginal distribution, characteristic function and lack of memory property. Multinomial distribution.

### UNIT II

Multivariate distributions-Multivariate normal distribution (both singular and non-singular)- marginal and conditional distributions, properties and characterizations, estimation of mean and dispersion matrix. Independence of sample mean and sample dispersion matrix.

### UNIT III

Jacobians of matrix transformations  $Y= AXB$ ,  $Y=AXA'$ ,  $X= TT'$ . Matrix variate gamma and beta distributions, Wishart distribution, distribution of generalized variance.

### UNIT IV

Quadratic forms of normal variables and vectors - Distribution of quadratic forms in normal variables (both scalar and vector quadratic forms), Cochran's theorem, Independence of quadratic forms. Simple, partial, and multiple correlation coefficients and their inter-relationships, tests, null and non-null distribution of simple and partial cases, null distribution of multiple correlation.

### Reference Books:

1. Anderson T.W.(1984) An introduction to multivariate statistical analysis, second edn, John Wiley.
2. Seber G.A.F. (1983) Multivariate Observations, John Wiley.
3. Giri N.(1984) Multivariate statistical inference, Academic publishers.
4. Johnson And Kotz (1981) Distribution of Statistics- Multivariate, John Wiley.
5. Rao.C.R(1973) Linear statistical inference and its applications (2<sup>nd</sup> Ed) Wiley Eastern ltd.