

**UNIVERSITY OF MADRAS**  
**B.Sc. DEGREE COURSE IN MATHEMATICS**  
**SYLLABUS WITH EFFECT FROM 2020-2021**

**BMA-CSA06**

**ALLIED: MATHEMATICAL STATISTICS-II**  
**(Common to B.Sc. Maths with Computer Applications)**

**Learning outcomes:**

**Students will acquire knowledge**

- To provide the foundation of statistical analysis used in varied applications.
- Of Sampling methods, Tests of significance and testing of hypothesis.

**UNIT I**

Sampling theory – Sampling Distributions – Concept of Standard error – Sampling distribution based on normal distribution- t, Chi Square and F distributions.

**UNIT II**

Point estimation – Concepts of unbiasedness – consistency – efficiency and sufficiency- Cramer Rao inequality – Methods of estimation- Maximum likelihood- moments - minimum square and their properties (Statement only).

**UNIT III**

Test of significance – Standard error- Large sample test, Exact test based on normal, t, chi-square and F distribution with respect to population mean/means, proportion/proportions, variance and correlation coefficient. Test of independence of attributes based on contingency tables- Goodness of fit based on chi-square.

**UNIT IV**

Analysis of Variance: One way, two way classification concepts & Problems. Interval estimation – Confidence intervals for population mean/means- Proportion/proportions and variances based on t, Chi-Square and F.

**UNIT V**

Test of hypothesis- Type I and II errors- Power of test – Neymann Pearson lemma- Likelihood ratio test-concepts of most powerful test- statements and results only-simple problems.

**Reference:**

- S.C.Gupta&V.K.Kapoor: Elements of Mathematical Statistics, Sultan Chand & Sons, NewDelhi.
- Hogg R.V. & Craig A.T. (1988 ): Introduction to Mathematical Statistics, McMillan.
- Mood A.M. & Graybill F.A. & Boes D.G. (1974): Introduction to theory of Statistics, McGraw Hill.
- Snedecor G.W. & Cochran W.G(1967) : Statistical Methods, Oxford and IBH.
- Hoel P.G. (1971) : Introduction to Mathematical Statistics, Wiley.
- Wilks S.S. Elementary Statistical Analysis, Oxford and IBH.

**e-Resources:**

1. <https://nptel.ac.in>
2. <https://www.wikipedia.org>.
3. <http://ebooks.lpude.in/statistics>.