

**MA 303 T - APPLIED STATISTICS (IE)**

| Teaching Scheme |   |     |   |           | Examination Scheme |    |    |           |         |             |
|-----------------|---|-----|---|-----------|--------------------|----|----|-----------|---------|-------------|
| L               | T | P   | C | Hrs./Week | Theory             |    |    | Practical |         | Total Marks |
|                 |   |     |   |           | MS                 | ES | IA | LW        | LE/Viva |             |
| 3               | 1 | --- | 7 | 4         | 30                 | 60 | 10 | ---       | ---     | 100         |

**Prerequisite:- MA 105**

**UNIT I – Distributions and Poisson Process 10**

Exponential distribution, Normal random variable, Distributions arising from the Normal: the Chi-square distribution, the t-distribution, the F-distribution. The Logistics distribution, Stochastic process, the Poisson process: definition of the Poisson process, Inter arrival and waiting time distribution, properties of Poisson process, distributions of sampling statistics.

**UNIT II Theory of Estimation 12**

Introduction, Maximum likelihood estimators, Interval estimates: confidence interval for a normal mean when the variance is unknown, confidence intervals for the variances of a normal distributions. Hypothesis testing: Introduction, significance level, tests concerning the mean of a normal population, Hypothesis tests concerning the variance of a normal distribution, tests concerning the mean of a Poisson distribution.

**UNIT III – Quality Control 10**

Introduction, control charts for average values: case of unknown  $\mu$  and  $\sigma$ . S control charts, control charts of fraction defective. Control charts for number of defects, other control charts for detecting changes in the population mean: moving average control charts, exponentially weighted moving-average, control charts, cumulative sum control charts.

**UNIT IV – Queuing theory 08**

Introduction, Cost equations, steady state probabilities, exponential models, Network of queues. The system M/G/1, the model G/M/1, Multi-server queues.

**APPROXIMATE TOTAL | 40 Hours**

**Texts and References**

1. S.C. Gupta & V.K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand & Sons, 11<sup>th</sup> Ed.
2. Sheldon M. Ross, Introduction to Probability Models, Academic Press, 10<sup>th</sup> Ed.
3. Sheldon M. Ross, Introduction to Probability and Statistics for Engineers and Scientists, Academic Press, 4<sup>th</sup> Ed.
4. Ronald E. Walpole, Sharon L. Myers and Keying Ye, Probability & Statistics For Engineers & Scientists, 8/E, Pearson Education.
5. Feller, William, An Introduction to Probability Theory and It's Applications. Wiley India Pvt. Ltd. (2008).
6. Jay L. Devore, Probability and Statistics for Engineering and the Sciences, Cenage Learning.