

Course Code	Course Name	Hours per Week			Total	Total
		L	T	P	Hrs	Credits
EC5BS01	Mathematics	4	0	0	4	4

### UNIT I

**Probability and Discrete Distribution:** Probability models, Algebra of events, probability axioms, conditional probability, Baye's theorem Discrete random variables, probability mass functions, discrete distribution functions-Binomial, Poisson ,Geometric.

### UNIT II

**Continuous Distribution and Hypothesis:** Continuous Random variable: Uniform distributions, Exponential distribution, Memory less property, Hypo exponential, Erlang, Beta, Gamma, Weibull, Hyper exponential and Normal distributions. Elementary concept of estimation and theory of hypothesis.

### UNIT III

**Stochastic Process:** Classification , Poisson process, renewal process. Discrete and continuous time Markov Chain ,State transition diagram, Transient analysis, Chapman – Kolmogorov Equations, irreducibility, recurrence, ergodicity , Steady-State Solutions of Markov Chains.

### UNIT IV

**Queuing Theory:** Introduction to structure of queuing models, kendall's notation for classification, little's formula, Queuing systems, traffic intensity, concepts of queuing models (M/M/1: Infinity/ Infinity/ FC FS), (M/M/1: N/ Infinity/ FC FS), (M/M/S: Infinity/ Infinity/ FC FS).

### Unit V

**Reliability:** Introduction, Measure of reliability, reliability functions, derivation of reliability function, failure rate and failure models, mean time to system failure (MTSF), Failure time distribution. System configuration: series and parallel, k out of n systems, Redundancy.

Text and Reference Books:

1. Donald Gross, Carl M. Harris, “ Fundamentals of Queuing Theory”, 2nd Ed. John Wiley and Sons, New York,
2. Hwei Hsu, Schaum's Outline of Probability, Random Variables, and Random Processes, 2nd Ed, McGraw-Hill, 2010.
3. Johnson, R.A. Probability and Statistics, PHI, New Delhi, 1994.
4. Kishore S. Trivedi, Probability & Statistics with Reliability, Queuing and Computer Sc. Applications, PHI, 2001.
5. T. Veerajan, Probability, Statistics and Random Processes, Tata McGraw Hills, New Delhi, 2002.
6. S. Lipschutz, Schaums Outline series: Theory and Problems of Probability, McGraw-Hill Singapore, 1982.
7. E. Balagurusamy, Reliability Engineering, Tata McGraw-Hill Education, 1984.