

Year & Sem: E1S2	Course Code: EC1301	Course Name: Probability and Stochastic Process	No. of Credits: 4	L 2	T&PS 2	P 0
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Unit-I:

Introduction to Uncertainty, Set theoretic Notation, Sample spaces and Simple Outcomes, Sigma Field and Compound Events, Probability Measure function, Mutually Exclusive Events, Conditional Probability Measure, Independent Events, Bayes' Theorem.

Unit-II:

Random Variables and their Distributions- Examples, Mathematical Expectation, Discrete Probability Distributions, Continuous Probability Distributions, Functions of Random Variables, Correlation coefficient and Bivariate Normal Distribution.

Unit-III:

Moments and Moment Generating Functions, Cumulants, Conditional Distribution Function, Cumulative Probability Distribution, Probability Density Function Characteristic Function.

Unit-IV:

Order Statistics and Limit Theorems: Order Statistics, Convergence of Sequence of Random Variables, Weak Law of Large Numbers, Strong Law of Large Numbers, Central Limit Theorem.

Unit-V:

Stochastic Processes: Stationarity of Stochastic Processes, Auto correlation, Cross correlation Functions and Ergodicity, Power Spectral Density Function, Linear Systems with Random Inputs, Random walk and Telegraph signal process.

Unit-VI:

Special Stochastic Processes: Poisson Process, Gaussian Process, Processes Depending on Stationary Gaussian Process, Markov chains.

References/Text Books:

1. A. Papoulis: Probability, Random Variables and Stochastic Processes
2. E. Parzen, Introduction to Probability
3. H.L. Van Trees Detection, Estimation and Modulation Theory Part-I, Wiley, 1968
4. J.B. Thomas, Introduction to Probability Springer Verlag 1986
5. W.B. Davenport Jr. Probability and Random Processes: An Introduction to Applied Scientists and Engineers Mc-Graw Hill 1970
6. C.W. Helstrom Probability and Stochastic Processes for Engineers, 2nd ed, Macmillan 1990
7. Scott L. Miller and Donald Childers, Probability and Random processes, Elsevier 2011.
8. George R. Cooper and Clare D. McGillen, Probabilistic Methods of Signal and System analysis, Oxford University Press, 2009.
9. Oliver C. Ibe, Fundamentals of Applied probability and Random processes, Academic press (an imprint of Elsevier), 2010.

Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.