

## **MA2040: PROBABILITY, STATISTICS AND STOCHASTIC PROCESS**

### **Course Content:**

Probability: Probability models and axioms, conditioning and Bayes' rule, independence discrete random variables; probability mass functions; expectations, examples, multiple discrete random variables: joint PMFs, expectations, conditioning, independence, continuous random variables, probability density functions, expectations, examples, multiple continuous random variables, continuous Bayes rule, derived distributions; convolution; covariance and correlation, iterated expectations, sum of a random number of random variables. Stochastic processes: Bernoulli process, Poisson process, Markov chains. Weak law of large numbers, central limit theorem. Statistics: Bayesian statistical inference, point estimators, parameter estimators, test of hypotheses, tests of significance.

### **TextBooks:**

1. **D. Bertsekas and J. Tsitsiklis**, Introduction to Probability, 2nd ed, Athena Scientific, 2008.

### **ReferenceBooks:**

1. **K.L. Chung**, Elementary Probability Theory with Stochastic Process, Springer Verlag, 1974.
2. **A. Drake**, Fundamentals of Applied Probability Theory. McGraw-Hill, 1967.
3. **O. Ibe**, Fundamentals of Applied Probability and Random Processes, Academic Press, 2005.
4. **S. Ross**, A First Course in Probability. 8th ed. Prentice Hall, 2009.

### **Prerequisite:**

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