# *Industrial and Management Engineering*    **IIT Kanpur**

**IME602: Probability and Statistics**                                                    3-0-0-9

**Course objectives:** This is a foundation course in Probability and Statistics for first semester students of MTech and PhD in IME Department.

**Prerequisites:** None

**Course contents:**

Probability: Sample space, events, axioms of probability, conditional probability, Bayes Theorem, independence

Random variables: density and distribution functions, expected values and descriptive statistics, moment generating functions, functions of random variables, Jointly distributed random variables, Chebychev inequality, Central limit theorem

Standard distributions: Bernoulli, Binomial, Poisson, Geometric, Hypergeometric, uniform, exponential and normal

Sampling: Random Sampling, Sampling distribution

Statistical Inference: Estimation-Properties of estimators, maximum likelihood, method of moments, least squares (Simple linear regression as an application), confidence intervals; Hypothesis testing-Simple hypothesis, goodness of fit, contingency tables

**Class schedule:**

Tuesday: 10.30 a.m. - 12.00 noon  (Venue: C4, IME Building)

Friday: 2.00 - 3.30 p.m. (Venue: C3, IME Building)

Instructor: Dr Sri Vanamalla V (email: vanamala@iitk.ac.in)

Grading:

Quizzes (2): 15x2 = 30

Mid-semester: 30

End-semester: 40

(There may be a slight variation in these weights which will be informed.)

**Books:**

(1) Introduction to Probability theory and Statistical inference: Harold J Larson

(2) Introduction to Probability models: Sheldon Ross

(3) Introduction to Mathematical Statistics and its applications: Richard J Larsen

(4) Applied Linear Regression Models: Kutner, Nachtsheim, Neter, Wasserman

5 September, 2017                                                  Sd/- Sri Vanamalla V