Course Plan for Autumn Semester 2017 Tezpur University Course : MS201, Mathematics III L2-T1-P0-CH3-CR3

Name of the instructor:

Dr. Pankaj Kumar Das and Dr. Debopam Chakraborty

Abstract:

This course provides a basic understanding of Probability and Statistics.

Course Objective:

Main objective is to provide students an adequate understanding of the basic concepts of probability theory and stastistics for applying them to problem solving in science and engineering.

Pre-requisites of the course: None

Course outline+ suggested reading:

Module-I

Characteristics of data: Central tendency, dispersion, skewness and kurtusis and their measures, Histogram, Frequency curve and box plot.

Definitions of random experiment, sample space, Probability and random variable. Properties of Probability.

Module-II

Correlation, correlation coefficient, simple linear regression and regression coefficient.

Probability Distribution and Expectation. Discrete distributions, Bernoulli, binomial, Poisson, geometric, negative binomial distributions. Properties (mean, variance, moments of these distributions).

Module-III

Population, sample, census, sampling unit, sampling frame, random sampling. Sampling fluctuations, Simple random sampling.

Continuous distributions, viz. uniform, exponential, normal, beta and gamma distributions. Their mean, variance, moments and some properties.

Module-IV

Definitions of statistical hypothesis, power, errors (Type-I and II), p-value and level of significance of a statistical test. Some standard tests.

What is a stochastic process? Introduction to Poisson process and M/M/1 Queuing model.

Textbook(s)

- 1. Medhi, J. Statistical Methods: An introductory Text, (New Age International (P) Ltd, 2000).
- 2. Rohtagi, V.K. An introduction to Probability and Mathematical Statistics. John Wiley and Sons. Inc.

1976.

Pedagogy:

- 1. Lecture and Discussion.
- 2. Presentations.
- 3. Problem solving.
- 4. Heuristic approach in selected topics.

Time plan: (Dr Pankaj K Das)

Lecture No.	Торіс
1-3	Definitions of random experiment, sample space, Probability and
	random variable, Properties of Probability.
4-6	Probability Distribution and Expectation.
7-10	Discrete distributions, Bernoulli, binomial distributions
11-14	Poisson, geometric, negative binomial distributions
15-17	Properties (mean, variance, moments of these distributions)
18-20	Continuous, uniform distributions
21-23	Exponential, Normal distributions
24-37	Normal, beta and gamma distributions
28-30	Their mean, variance, moments and some properties.

Time plan: (Dr. Debopam Chakraborty)

Lecture No.	Торіс
1-5	Characteristics of data: Central tendency
5-9	dispersion, skewness and kurtosis and their measures
10-15	Correlation, correlation coefficient, simple linear regression and regression coefficient
16-20	Population, sample, census, sampling unit, sampling frame, random sampling. Sampling fluctuations, Simple random sampling
21-28	Definitions of statistical hypothesis, power, errors (Type-I and II), p- value and level of significance of a statistical test. Some standard tests.
28-30	What is a stochastic process? Introduction to Poisson process and M/M/1 Queuing model