



## SECOND SEMESTER 2015-2016 COURSE HANDOUT (Part II)

In addition to Part I (General Handout for all courses appended to the time table) portion here give specific details regarding the course.

**Course Number** : MATH F113  
**Course Title** : Probability & Statistics  
**Instructor-Incharge** : RAKHEE  
**Instructors** : Ashish Tiwari, C.B. Gupta, Chandra Shekhar, Jitender Kumar, Pradeep K. H. Keskar, Sachin Kumar, Shivi Agarwal, Sumanta Pasari, Suresh Kumar.

### 1. Scope and objective of the course:

Probability theory deals with many real life problems, which either inherently involve the chance phenomena or describing the behavior of the system explicitly with statistical properties. Interpretation of the system behavior in many engineering aspects depends on concept of probability and statistics that familiarize with the computational aspects. The course deals with basic properties of various distributions and other related things.

### 2. Text Books:

1. Milton, J. S. and Arnold, J. C.: Introduction to Probability and Statistics Principles and Applications for Engineering and the Computing Sciences', 4<sup>th</sup> edition, Tata McGraw-Hill, 2007.

### 3. Reference Books:

1. Meyer, P. L.: Introduction to Probability & Statistics, 2<sup>nd</sup> edition, Oxford & IBH, 1970.
2. Ross, Sheldon M: Introduction to Probability Models, 3<sup>rd</sup> edition, Elsevier, 2009.
3. Walpole, R. E., Myers R. H., Myer S. L., Ye K., Probability & Statistics for Engineers and Scientists, 8<sup>th</sup> edition, Pearson Education, 2007.
4. Johnson, R. A.: Miller Freund's Probability and Statistics, 7<sup>th</sup> edition, PHI, 2005.

### 4. Lecture Plan:

Lecture	Topic	Article
1	Introduction to probability, sample spaces, events, permutation and combinations	1.1-1.3





2-4	Axioms of probability, conditional probability, independence and the multiplication rule, Bayes' theorem	2.1, 2.2, 2.3, 2.4
5-8	Random variable, discrete probability densities, cumulative distribution, expectation, variance and standard deviation, geometric distribution, moment generating function	3.1, 3.2, 3.3, 3.4
9-11	Binomial distribution, hyper geometric distribution, Poisson distribution	3.5, 3.7, 3.8
12-15	Continuous densities, cumulative distribution and distribution parameters, uniform distribution, gamma distribution, exponential and chi square distribution.	4.1, 4.2, 4.3
16-20	Normal distribution, standard normal distribution, Chebyshev's inequality, normal approximation to binomial distribution.	4.4, 4.5, 4.6
21-24	Joint densities and independence, marginal distribution: discrete and continuous, expectation, conditional densities (discard regression)	5.1, 5.2, 5.4
25 - 26	Simulating a discrete distribution and continuous distribution	3.9, 4.9
27-28	Random sampling, sample statistics	6.1, 6.3
29-31	Point estimation, method of moments & maximum likelihood, functions of random variables, central limit theorem.	7.1-7.4
32-35	Interval estimation of variability, estimating the mean and Student-t distribution, hypothesis testing, hypothesis tests on the mean	8.1-8.5
36-38	Estimating proportions, testing hypothesis on a proportion	9.1, 9.2
39-40	Model and parameter estimation, Correlation	11.1, 5.3, 11.6





#### 4. Evaluation Scheme:

EC No.	Evaluation Component	Duration	Weightage (%)	Marks	Date & Time	Remarks
1	Mid-Semester	90 minutes	35	105	17/3 11:00 - 12:30 PM	Closed Book
2	Class Test/Assignments	-----	20	60	unannounced	Closed Book
3	Comprehensive	3 Hours	45	135	10/5 AN	Open Book

#### 5. Announcements:

All notices in relation to the above course will be put up on NALANDA and Department of Mathematics notice board.

#### 6. Make up policy:

Make up for the mid-semester/comprehensive examination will be given to genuine cases only. For class test component there will be **no** make-up under **any circumstances**.

#### 7. Chamber consultation hours:

To be announced in the respective tutorial class by the respective instructor.

**Instructor In-Charge**  
**MATH F111**

