BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI-K.K. BIRLA GOA CAMPUS
INSTRUCTION DIVISION
FIRST SEMESTER 2017-18
COURSE HANDOUT (Part II)

Date: 30/07/2017

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-In-charge : **BIJIL PRAKASH**
Instructors : **Mayank Goel, Samantha Gauranga C., Prabal Paul, Godinho Aloysius Querobino and Shah Parth Mukeshbhai.**

1. **Scope and objective of the course:**
   Course introduces the concept of probabilistic models and enables the student to become familiar with probabilistic concepts; a selected study of discrete & continuous distributions is done. Finally probability theory is related with statistical inference.

2. **Text Books:**
   J. S. Milton and J. C. Arnold, Introduction to Probability and Statistics 'Principles and applications for engineering and the computing sciences', 4th ed., Tata McGraw-Hill Pub.

3. **Reference Books:**
   1. Sheldon M Ross, Introduction to Probability and Statistics for Engineers and Scientists, 4th Edition, Elsevier, 2012.
   2. Feller, Vol: 1, 2: An Introduction to Probability Theory and Applications, 3rd edition, John Wiley & Sons, 2008.
   3. Sheldon M. Ross: A First Course in Probability, 7th edition, Prentice Hall, 2002.
   4. Richard A. Johnson, Miller & Freund's: Probability & Statistics for Engineers, 6th Edition, Pearson Education Inc., First Indian Reprint, 2001.
   5. Hogg, R. V. and Craig, A. T.: Introduction to Mathematical Statistics, Pearson Education, 2005.

4. **Lecture Plan:**

Lecture No.	**Topics to be covered**	**Chapter/Sec.**
1 - 3	Introduction, Sample Spaces, Events, Axioms of Probability; Conditional Probability; Independent Events; Bayes' Theorem.	1.1, 1.2, 1.3 (Self-study*) 2.1 - 2.4
4 - 10	Random Variable of Discrete Type, Probability Distribution, Probability Mass Function (pmf), Cumulative Distribution Function (cdf), Expectation, Variance and Moment Generating Function (MGF) Standard Discrete Distributions, such as, Binomial, Hyper geometric, Geometric and Poisson, and their Applications.	3.1 - 3.5, 3.7, 3.8 and lecture notes
11, 12	Random Variable of Continuous Type, Probability Distribution, Probability Density Function (pdf), cdf., Expectation, Variance and MGF.	4.1, 4.2

13 - 20	Standard Continuous Distributions, such as, Uniform, Exponential, Normal, Gamma and Chi-Square, and their applications. Chebychev's Inequality, Chebychev's Rule, Empirical Rule.	4.3 - 4.6 and lecture notes
21, 22	Simulation: Discrete and Continuous.	3.9, 4.9 and lecture notes
23, 24	Functions of more than one Random Variables, Joint Distribution, Joint pdf and cdf, Marginal pdf. Independence of Random Variables.	5.1
25 - 27	Conditional Distributions, Conditional Expectation, Variance, Covariance and Correlation.	5.2 – 5.4
28, 29	Transformation of Variables. Univariate and Bivariate Case.	4.8 and 5.5
30, 31	Populations, Random Sample, Sampling Distributions, Statistics; Distribution of sample mean and sample variance.	6.1, 6.3, 7.3 and lecture notes
32 - 35	Point and Interval Estimation, Central Limit Theorem and Its Applications; Estimation of mean, Students t-distribution.	7.1, 7.2, 7.4, 8.1 and 8.2
36 – 38	Hypotheses Testing and Testing on the Mean and Variance.	8.3, 8.5 and 8.6
39 - 42	Linear Regression.	11.1 – 11.3

* Questions will be asked in the tests, quiz and comprehensive.

5. **Evaluation Scheme:**

Component	**Duration**	**Max. Marks**	**Date & Time**	**Remarks**
Mid Sem Test	90 minutes	90	12/10/17, Thursday 02:30-03:30 pm	CB
Surprise tests / Assignments	**	90	Will be announced later.	OB/CB
Comprehensive	3 hours	120	09.12.17 (FN)	CB

** to be informed just before the test.

CB – Closed Book

OB – Open Book

6. **Notices**: All notices in relation to above course will be put up on the MOODLE**.**

7. **Make up Policy:** Make up will be given only for **genuine cases** and for that **prior permission** has to be obtained from I/C.

8. **Chamber consultation hours**: To be announced in lecture/tutorial class by the respective lecturers/Tutors

Instructor-in-charge
MATHF 113.