

UNIVERSITY OF KERALA
Complementary Course in STATISTICS
for the students of BSc Degree Programme in Mathematics under CBCSS
SYLLABUS

(Applicable from 2014 Admissions)

Semester: 2

Type of course: **Complementary**

Course Code: **ST1231.1**

Course Name: **RANDOM VARIABLES**

Instruction Hours/Week: 4

Number of credits: 3

- Module 1:** Random variables: discrete and continuous, probability mass function (pmf) and probability density function (pdf), distribution function (df), joint distribution of two random variables, marginal and conditional distributions, independence, transformation of variables, one-to-one, transformation of discrete and continuous type of one random variable. **(20H)**
- Module 2:** Expectation of random variables and its properties, theorems on expectation of sums and product of independent random variables, conditional expectation, moments, moment generating function, characteristic function, their properties and uses; Bivariate moments, Cauchy-Schwartz inequality and correlation coefficient. **(17H)**
- Module 3:** Bivariate data: Scatter diagram, Fitting of curves-Principle of least squares, fitting of straight line, fitting parabola, curves $y=ab^x$, $y=ae^{bx}$ and $y=\frac{a}{x}+b$. **(17H)**
- Module 4:** Straight line regression and prediction, Karl Pearson's coefficient of correlation, Spearman's rank correlation. **(18H)**
- Module 5:** Practical based on Modules 1, 2, 3 & 4- Random variables (univariate and bivariate), expectations, moments and curve fitting, correlation and regression.

References

1. Bhat B.R. (1985): Modern Probability Theory, New Age International (P) Ltd.
2. Gupta S.C. and Kapoor V.K. (1980): Fundamentals of Mathematical Statistics, Sultan Chand and Sons, Delhi.
3. Jim Pitman (1996): Probability, Narosa Publishing House, New Delhi.
4. Rohatgi V.K. (1993): An introduction to probability theory and mathematical statistics, Wiley Eastern, New Delhi.
5. Parimal Mukhopadhyay (1996): Mathematical Statistics, New Central Book Agency (P) Ltd, Calcutta.

PS: This is only a copy of the syllabus of the course, published by the University and is primarily intended to provide an easy reference to the students of the course. As the University is the final authority, as far as the syllabus of a course is concerned, the students are advised to verify that the University has not made subsequent changes in the syllabus of the course.