

K. J. SOMAIYA COLLEGE OF SCIENCE AND COMMERCE , AUTONOMOUS

Interdisciplinary Advance course in Statistics

Course Details

**Department of Statistics
2019-2020**

This document contains the structure of course, details of syllabus and evaluation pattern.

Course Details

- ❖ **Course type** : Certificate
- ❖ **Course Title** : Interdisciplinary Advance course in Statistics
- ❖ **Preamble** : The interdisciplinary approach has become an important and challenging technique in the in the modern curriculum. Interdisciplinary study allows the student to learn by making connections between ideas and concepts across different disciplinary boundaries. Students learning in this way are able to apply the knowledge gained in one discipline to another different discipline as a way to deepen the learning experience. This can occur by allowing students to choose their own subjects and their learning is deepened when they reflect on the connections between what they are learning in different disciplines. The underlying philosophy of the “Interdisciplinary Advance certificate course in Statistics” is to develop research skills of the students who have basic knowledge of statistics.
- ❖ **Objectives of course** : To provide, an understanding, for the any UG/PG student (especially non statistics students), how to analyze data statistically.
- ❖ **Learning Outcomes** : By completing this course the student will learn to
 - Acquaint students in understanding difference between discrete and continuous random variables, their probability functions and mathematical expectations
 - Study various discrete and probability distributions such as binomial, poisson and continuous probability distribution Normal distribution, with their properties, applications
 - Understand a concept of point estimation and interval estimation for large and small sample, testing of hypothesis, make the appropriate statistical decision for large and small sample, ANOVA
 - Introduction to non-parametric test
 - Enable efficient use of statistical software such as Excel, R.
 - Develop the ability to use statistical knowledge and skills in other disciplines
- ❖ **Prerequisites / Eligibility Criteria** : The syllabus assumes the knowledge of Basic statistics.

- ❖ **Intake Capacity** : 20
- ❖ **Duration** : 30 hours
- ❖ **Course Coordinator** : Mr. Prashant Shah
- ❖ **Career opportunities:** It provides a firm foundation for the learner who intends to study statistics and/or related subjects up to and beyond graduate Level and for the statistical requirements of a wide range of professions

❖ **Syllabus** :

Theory:

- i) ***Random Variables and Standard Probability Distributions:***
Definition of discrete and continuous random variables, properties of probability mass function, probability density function and cumulative distribution functions, mathematical expectation, Binomial, poisson, normal distributions. Normal approximations of a binomial and poisson distribution
- ii) ***Estimation and testing of hypothesis:*** Point and interval estimation, Large sample test, Small sample test, Chi-square test, F-test, ANOVA (One, Two and Three way classification)
- iii) ***Non-parametric test:*** Single and double sample sign test, Wilcoxon sign ranked test, Median test, Run test

Practical: Statistical analysis using statistical software such as Excel, R.

❖ **Evaluation Pattern** :

- One internal assessment (test/assignment/quiz/open book test etc.) on each topic carrying 30 marks each: $3 * 30 = 90$ marks
- One Project at the end of course: 60 marks
- Total marks: 150 marks