**POST GRADUATE DEPARTMENT OF STATISTICS**
**SAMBALPUR UNIVERSITY**
**M.A/M.Sc. STATISTICS COURSES OF STUDY FOR 2022-2024**

## MA/MSc. STATISTICS

## SEMESTER-I

## STATISTICAL METHODS-I

**MSC- 411** **4CH**

**Objective:** Statistical methods provide scientific view to conduct the survey in proper way to collect the data about specific perspective. It helps to learn how to develop regression model and apply for the specific perspective data appropriate manner. This paper presents the general theory of statistical distributions as well as the standard distributions found.

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| **CO-1** | Remember and understand the basic concepts/Principles of Statistical Methods-I |
| **CO-2** | Analyse the Various Concepts to understand them through case studies |
| **CO-3** | Apply the knowledge in understanding practical problems |
| **CO-4** | Execute/Create the Project or field assignment as per the knowledge gained in the course |

**Unit-I**
Introduction to different measures such as measures of location, dispersion and skewness. Basic concept of discrete and continuous probability distributions and their properties. Basic discrete distributions- Bernoulli, Binomial, Poisson and Uniform, Computations of their moments, means, Variances and Beta coefficients, recurrence relations between moments, M.G.F. and C.F. Basic continuous distributions: - Uniform and normal distributions their properties and applications. Computation of their M.G.F., C.F. and Moments.

**Unit-II**
Analytical Statistics: - Bivariate data, Scatter diagram, Simple correlations and linear regression. Their properties and applications. Curve fitting, linear and second-degree curve and their applications.

**Unit-III**
Random vectors, joint distribution, joint M.G.F., Independence of random variables. Multinomial distributions and its mean vector and variance and co-variance matrix, bivariate normal distributions, conditional expectation and conditional variance. Its marginal and conditional distributions.

**Unit-IV**
Sampling distributions of Statistics: Sampling distributions of sample mean, sample variance, Derivations of Chi- square, $\chi$, t and F distributions, tests of significance based on them and their applications.

**Books Recommended:**


1. Fundamental of Mathematical Statistics (2009)- S Chand & Sons- S.C. Gupta and V.K. Kapoor
2. Introduction to Theory and Mathematical Statistics (1988) - Wiley V.K. Rohatgi,

3. Linear Statistical Inference and its Applications (1975) – Wiely- C.R. Rao
4. An Introduction to Theory of Statistics - Charles Griffiu Yale, G.U. and Kendall, M.G. (1953)
5. Probability and Statistics with Engineering and Computer Science Applications (2005) – Kalyani Swain, A.K.P.C.
6. John E. Freud's Mathematical Statistics with Applications(2006); (7th Edition- Pearson Education; Asia-Miller; Irwin and Miller; Marylees.
7. Applied Statistics (1999)- New Central Book Agency- Mukhapaddhyay P.