The University of Burdwan

B.Sc General in Statistics

CBCS syllabus (effect from 2017-2018)

Semester- I

CC-1

Statistical Methods 4 Credits

Unit 1

Introduction: Definition and scope of Statistics, concepts of statistical population and sample. Data: quantitative and qualitative, attributes, variables, scales of measurement - nominal, ordinal, interval and ratio. Frequency distribution, **Presentation:** tabular and graphic, including histogram and ogives.

Unit 2

1. **Measures of Central Tendency:** mathematical and positional.
2. **Measures of Dispersion:** range, quartile deviation, mean deviation, standard deviation, coefficient of variation, moments, skewness and kurtosis.

Unit 3

Bivariate data: Definition, scatter diagram, simple, partial and multiple correlation (3 variables only), rank correlation (Spearman). Simple linear regression, principle of least squares and fitting of polynomials and exponential curves.

Unit 4

Theory of attributes, consistency of data, independence and association of attributes, measures of association and contingency.

Reference Books

- Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I& II, 8th Edn. The World Press, Kolkata.
- Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.
- Mood, A.M. Graybill, F.A. AndBoes, D.C. (2007): Introduction to the Theory of Statistics,3rd Edn. (Reprint), Tata McGraw-Hill Pub. Co. Ltd.
- Goon A.M., Gupta M.K. and Dasgupta B. : Basic Statistics. The World Press, Kolkata.
- Chakraborty, Arnab (2016) : Probability and Statistics. Sarat Book House.

Statistical Methods Lab (Prac) 2 Credits

List of Practical

1. Graphical representation of data
2. Problems based on measures of central tendency
3. Problems based on measures of dispersion
4. Problems based on combined mean and variance and coefficient of variation
5. Problems based on moments, skewness and kurtosis
6. Fitting of polynomials, exponential curves
7. Karl Pearson correlation coefficient
8. Partial and multiple correlations
9. Spearman rank correlation with and without ties.
10. Correlation coefficient for a bivariate frequency distribution
11. Lines of regression, angle between lines and estimated values of variables.
12. Checking consistency of data and finding association among attributes.

Semester- II

CC-2

Introductory Probability (Th) 4 Credits

Unit 1

Probability: Introduction, random experiments, sample space, events and algebra of events. Definitions of Probability – classical, statistical, and axiomatic. Conditional Probability, laws of addition and multiplication, independent events, theorem of total probability, Bayes' theorem and its applications.

Unit 2

Random Variables: Discrete and continuous random variables, p.m.f., p.d.f., c.d.f. Illustrations of random variables and its properties. Expectation, variance, moments and moment generating function.

Unit 3

Convergence in probability, almost sure convergence, Chebyshev's inequality, weak law of large

numbers, De-Moivre Laplace and Lindeberg-Levy Central Limit Theorem (C.L.T).

Unit 4

Standard probability distributions: Binomial, Poisson, geometric, negative binomial, hypergeometric, uniform, normal, exponential, beta, gamma.

Reference Books

- Hogg, R.V., Tanis, E.A. and Rao J.M. (2009): Probability and Statistical Inference,

Seventh Ed, Pearson Education, New Delhi.

- Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.
- Myer, P.L. (1970): Introductory Probability and Statistical Applications, Oxford & IBH Publishing, New Delhi
- Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I& II, 8th Edn. The World Press, Kolkata.
- Chakraborty, Arnab (2016): Probability and Statistics. Sarat Book House.
- Ross, S. (2002): A First Course in Probability, Prentice Hall.

Introductory Probability Lab (Prac) 2 Credits

List of Practical

1. Fitting of binomial distributions for n and p = q = ½ given
2. Fitting of binomial distributions for n and p given
3. Fitting of binomial distributions computing mean and variance
4. Fitting of Poisson distributions for given value of lambda
5. Fitting of Poisson distributions after computing mean
6. Application problems based on binomial distribution
7. Application problems based on Poisson distribution
8. Problems based on area property of normal distribution
9. To find the ordinate for a given area for normal distribution
10. Application based problems using normal distribution
11. Fitting of normal distribution when parameters are given
12. Fitting of normal distribution when parameters are not given