

# **KOLHAN UNIVERSITY, CHAIBASA**

## **DEPARTMENT OF STATISTICS**

### **Proposed Syllabus for FYUGP, NEP-2020**

**(Effective from Academic Year-2022-23 onwards)**

**(Semster-1)**

### **Major Paper-MJ-01-Descriptive Statistics**

**Credits:** Theory: 03 (Full marks: 60+15=75, Pass Marks: 30)  
Practical: 01(Full marks: 25, Pass Marks: 10)

#### **Unit I**

Introduction to Statistics, Meaning of Statistics as a Science, Importance of Statistics. Scope of Statistics in Industry, Biological sciences, Medical sciences, Economics, Social Sciences, Management sciences, Agriculture, Insurance, Information technology, Education and Psychology. Statistical organizations in India and their functions: CSO, ISI, NSS, IIPS (Devnar, Mumbai), Bureau of Economics and statistics.

#### **Unit II**

Population and Sample. Variables: Interval scale, ratio scale, discrete and continuous variables, difference between linear scale and circular scale. Primary and secondary data, Cross-sectional data, time series data, directional data. Notion of a statistical population: Finite population, infinite population, homogeneous population and heterogeneous population. Notion of a sample and a random sample.

#### **Unit III**

Classification: Raw data and its classification, ungrouped frequency distribution, Sturges' rule, grouped frequency distribution, cumulative frequency distribution, inclusive and exclusive methods of classification, Open end classes, and relative frequency distribution. Measures of Central Tendency. Partition Values: Quartiles, Deciles and Percentiles (for ungrouped and grouped data), Box Plot. Measures of Dispersion, Moments, Skewness and Kurtosis.

#### **Unit IV**

Theory of Attributes: Nominal scale, ordinal scale, classification, notion of manifold classification, dichotomy, class- frequency, order of class, positive class-frequency, negative class frequency, quanta class frequencies, ultimate class frequency, relationship among different class frequencies (up to three attributes), dot operator to find the relation between frequencies, fundamental set of class frequencies. Consistency of data up to 2 attributes. Concepts of independence and association of two attributes. Yule's coefficient of association (Q),  $-1 \leq Q \leq 1$ , interpretation. Examples and Problems.

#### **References:**

1. Gun, A.M., Gupta, M.K. and Dasgupta, B. (2013). Fundamental of Statistics, Vol I, World Press, Kolkata.

2. Gun, A.M., Gupta, M.K. and Dasgupta, B. (2011). Fundamental of Statistics, Vol II, World Press, Kolkata.
3. Hanagal, D. D. (2009). Introduction to Applied Statistics: A Non-Calculus Based Approach. Narosa Publishing Comp. New Delhi.
4. Miller, I. and Miller, M. (2006). John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.
5. Mood, A.M. Graybill, F.A. and Boes, D.C. (2011). Introduction to the Theory of Statistics, 3rd Edn., Tata McGraw-Hill Pub. Co. Ltd.

## **Minor Paper MN-1A- Introduction to Probability Theory**

**Credits:** Theory: 03 (Full marks: 60+15=75, Pass Marks: 30)  
 Practical: 01(Full marks: 25, Pass Marks: 10)

### **Unit I**

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 II**

Random Variables: Discrete and continuous random variables, Probability mass function (p.m.f.), Probability density function (p.d.f.), Cumulative distribution function (c.d.f.) Illustrations of random variables and their properties. Expectation, variance, moments and moment generating function.

### **Unit III**

Standard probability distributions: Binomial, Poisson, geometric, negative binomial, hyper geometric, uniform, normal, exponential, beta, gamma and their applications. Fitting of Binomial, Poisson and Normal Distributions

### **Unit IV**

Chebyshev's inequality, Convergence in probability, Weak law of large numbers, convergence in Distribution, De-Moivre Laplace and Lindeberg-Levy Central Limit Theorems (C.L.T.).

### **References:**

1. Hanagal, D. D. (2009). Introduction to Applied Statistics: A Non-Calculus Based Approach. Narosa Publishing Comp. New Delhi.
2. Meyer, P.L. (1970). Introductory Probability and Statistical Applications, Oxford & IBH Publishing, New Delhi.
3. Rohatgi, V. K. and Saleh A.K.M.E. (2008). An Introduction to Probability Theory and Mathematical Statistics, Wiley Eastern.

