

Swami Ramanand Teerth
Marathwada University, Nanded.

SYLLABUS
OF
STATISTICS

B.A./B.Sc. First Year

Semester - I

Probability and Random Variable

Paper-I

Descriptive Statistics and Attributes.

Paper-II
(2009-10)

STATISTICS

B.Sc. First Year

Semester- I

Probability and Random Variable

Paper-I

Unit-I- Probability :

Random experiment, out come, trial and event. Exhaustive events, favourable events. Independent events, sample space, classical definition of probability. Empirical definition of probability. Axiomatic approach to probability, addition theorem of probability, extension of addition theorem of probability (upto 3 events), conditional probability. Conditional probability and independent events. Mutually and pair wise independent events, multiplication theorem of probability for independent events. Baye's theorem, problems.

Unit-II:- Random Variable (Univariate) :-

Random Variable , Distribution function, Discrete random variable. Probability mass function, Distribution function of discrete random variable. Continuous random variable, Probability density function. Distribution function of continuous random variable.

Unit III : Random Variable :

Definition. Two dimensional probability mass function, Marginal probability function, conditional probability function, Two dimensional distribution function, marginal distribution function Joint density function, marginal density function, Stochastic independence.

Unit IV : Mathematical Expectations: Definition, Expected value of random variable, expected value of function of a random variable properties of expectations, Various measures of Central Tendency, Dispersion. skewness and Kurtosis for continuous probability distribution, continuous distribution function. Variance, Properties of variance, covariance, Variance of a Linear combination of random variable, conditional expectations.

Unit -V: Moment Generating Function- Definition, Properties of moment generating function, cumulants, properties of cumulants.

Scope of Syllabus :

Fundamentals of Mathematical Statistics - S.C. Gupta & V.K. Kapoor

(11th Edition) Sultan Chand & Sons New Delhi.

Chapter 3:- 3.3, 3.4, 3.4.1, 3.5,.3.8, 3.8.1, 3.8.2, 3.8.5, 3.9, 3.9.1, 3.10.

3.11,3.12,3.13,3.14.1, 3.15, 3.15.1, 4.2

Theorem:- 3.2,3.3, 3.4, 3.5, 3.6, Cor.1. Cor.2,3,10,3.11,3.12,3.13,
3.14,3.15,3.16,3.17,3.18,3.19,3.20,4.2

Chapeter:5 5.1, 5.2, 5.2.1, 5.3.1, 5.3.2, 5.4, 5.4.1, 5.4.2, 5.4.3

5.5,5.5.1,5.5.2, 5.5.3, 5.5.4, 5.5.5, 5.5.6 Thorem 5.2 (Statement only)

Chapter 6:- 6.1,6.2,6.3,6.4,6.5,6.6,.6.6.1,6.8

Chapter 7:- 7.1, 7.1.2, 7.2, 7.2.1

Reference Books:-

1. Fundamentals of statistics volume- II- Goon A.M. Gupta M.K. ,and Dasgupta B.

(The World press Pvt. Ltd. Kolkatta)

2. Modern Elementary Statistics- Miller and Friends

3. Introductory Statistics. Neil weiss Pearson Publication.

4. Programmed statistics - B.L. Agrawal,

(New Age International Publication New Delhi.)

5. Introduction to the theory of Statistics, Mood A.M., Graybill F.A. and Boes F.A..

6. Introductory Probability and Statistical applications- Addison Wesley.

7. Statistical Method, S.P. Gupta, (Sultan Chand & Sons New Delhi.)

8. Statistics - A Begineer's Text, Volume II : B.R. Bhat,

T. Shrivenkataramana, K.S. Madhav Rao. (New Age International (p) Ltd.)

TATISTICS
B.Sc. First Year
Semester-I
Descriptive Statistics
Paper-II

Unit I: - Basic Statistics & Data Condensation :

Meaning of statistics, importance and scope of statistics in industry, medical science, social sciences, management science, agriculture and insurance. information technology, education & psychology. Statistical organizations in India and their functions CSO, ISI, NSS, IIPS, Bureau of Economics and Statistics, concepts of statistical regularity, sample, frequency distributions (continuous and discrete), methods of simple random sampling, stratified random sampling systematic sampling, presentation of data, Graphical presentation of data by frequency curve, frequency polygon, ogives, histogram and bar charts stem and leaf chart.

Unit - II Measures of Central Tendency:

Measures of central tendency Arithmetic mean, (simple and weighted) combined mean. Geometric mean. Harmonic Mean, Median Derivation of median formula, quartiles, Mode, calculating quartiles by analytical and graphical method. uses of mean mode and median. Merits and demerits of measures of central tendency, problems.

Unit - III Measures of Dispersion:

Concepts of measures of dispersion, Types of measures of dispersion, Range, Quartile Deviation, Mean absolute deviation, Standard deviation, Variance, Root mean square deviation. Properties of variance relation between Root mean square deviation and Standard deviation. Coefficient of variation.

Unit IV:- Moments :

Raw and central moments. Relation between moments raw moments & central moments (Up to 4th order). Effect of change of origin and scale on moments, Sheppard's correction for moments, Pearsonian coefficients Measures of skewness, kurtosis problems.

Unit V:- Demand and supply Analysis:

Demand and supply, Statement of laws. assumptions price elasticity of demand , significance of elasticity of demand. Demand function with constant

price elasticity. Price elasticity of supply, partial elasticities of demand, types of data required for estimating elasticities.

Scope of Syllabus :

1. **Fundamentals of Mathematical Statistics:** - S.C. Gupta & V.K. Kapoor
(Sultan Chand and sons New Delhi.)

Chapter 2:- 2.4, 2.4.1, 2.5, 2.5.1,2.5.2, 2.5.3, 2.6, 2.6.1, 2.6.2, 2.7, 2.7.1, 2.7.2,
2.8,2.8.1, 2.8.2, 2.9, 2.9.1, 2.11, 2.11.1., 2.12, 2.12.1, 2.13, 2.13.1,
2.13.2,
2.13,.3,2.13.4,2.14,2.14.1, 2.15,2.15.1,2.15.2,2.15.5,2.16,2.16.1
2.17.

2. **Descriptive Statistics :-**P.G. . Dixit, Dr. Mrs.V.R. Prayag.D.L. Limaye (Nirali Prakashan, 41 Budhwar Peth Pune-02).

Chapter1:- 1.1,1.2,1.3,1.4,1.5

Chapter2:- 2.1, 2.2, 2.3, 2.4

Chapter3:- 3.1 ,3.2, 3.4,

3. **Fundamentals of Applied Statistics :** S.C. Gupta & V.K. Kapoor
(Sultan Chand & Sons New Delhi).

Chapter4:- 4.1, 4.2, 4.2.1, 4.3, 4.4

Reference Books:-

1. Fundamentals of statistic volume-(1) Goon A.M. Gupta M.K. Dasgupta
(The World Press Pvt. Ltd. Kolkatta)
2. Modern Elementary Statistics- Freund J.E. (Prentice Hall New Jersey 1979)
3. Introductory Statistics- Neil Weiss (Pearson Publications.)
4. Programmed statistics - B.L. Agrawal,
(New Age Internatinal Publication New Delhi.)
5. Research Methodology - Kothari C.R. (Wiley Eastern Limited)
6. Statistics- A Begineer's Text, Volume I : B.R. Bhat. T. Shirvenkataramana
K.S. MadhavRao.
7. Statistical Medhods- S.P. Gupta.(Sultan Chand & Sons New Delhi).

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SYLLABUS
OF
STATISTICS

B.A. / B.Sc. First Year Semester - II

Discrete Probability Distributions

Paper-III

Statistical Methods and Attributes

Paper-IV

Annual Practical

Paper-V Practical - I

(2009-10)

B.A. /B.Sc. First Year
Semester - II
Discrete Probability Distributions
Paper-III

Unit. I. **Uniform Distribution** : Uniform Discrete Distribution :- Definition, Mean, variance and moment generating function.

Unit II. Binomial Distribution:- Bernoulli Distribution:- Definition, mean variance and moment generating function.

Binomial Distribution: Definition, moments , Moment generating function cumulants, Additive property of Binomial distribution, Recurrence Relation for the probabilities of Binomial distribution, Mode, Problems.

Unit III: Poisson Distribution:- Poisson distribution as a limiting case of Binomial Distribution, moments of Poisson distribution, mode of Poisson distribution, recurrence relation for moment of Poisson distribution, moment generating and cumulant generating function, additive property of Poisson distribution, recurrence formula for the probabilities of Poisson distribution.

Unit IV: Negative Binomial Distribution:- Definition, Moment generating function cumulants, Moments. Geometric Distribution definition, lack of memory, Moments of geometric distribution moment generating function , mean, variance. Applications of geometric distribution in the real life situation.

Unit V: Hypergeometric Distribution :- Definition, Mean and variance.

Scope of Syllabus :-

- (i) Fundamental of Mathematical Statistics (S.C. Gupta V.K. Kapoor)
(11 th Edition) ((Sultan Chand & Sons New Delhi)
- Chapter 8:- 8.1,8.2,8.3.1,8.4,8.4.1,8.4.5,8.4.6,8.4.7,8.4.9,8.4.12,
8.5,8.5.2,8.5.5,8.5.7,8.5.8,8.5.10,8.6,8.6.1,8.6.2,
8.7,8.7.1,8.7.2,8.7.3,8.8,8.8.1.

Reference Books:-

- (i) Mathematical Statistics :- H.C. Saxena (Sultan Chand & Sons New Delhi)
- (ii) New Mathematical Statistics (First Edition) Arora Sanjay and Bansilal.
Stya prakashan 16/ 7698 New Market New Delhi 5 (1989)
- (iii) Statistics :- a Beginners Text Volume - II B.R. Bhat T. Shivenkataramena
K.S. Madhav Rao.(New Age International (p) Ltd.
- iv) Introduction to Discrete Probability and Probability Distributions:-
Madhav B. Kulkarni , Surendra B. Ghatpande. (SIPE Academy, Nasik.)

STATISTICS

B.A./B.Sc. First Year

Semester - II

Statistical Methods and Attributes.

(Paper - IV)

Unit-I:- Correlation, Scatter diagram, product moment correlation coefficient and properties, Spearman's rank correlation coefficient (Repeated and unrepeatd ranks). Derivation of rank correlation coefficient formula & its limits.

Unit -II Regression :- Regression coefficients, lines of regression & their properties, properties of regression coefficients, problems.

Unit -III:- Method of least squares ; Legendre's principle of least squares, fitting of straight line, second degree curve, an exponential curve, power curve. Illustration of logistic curve $y = k/(1 + \text{Exp}(a+bx))$. Interpretation of $(b < 0)$ $(b > 0)$. Most plausible values of system of linear equations.

Unit : IV:- Theory of Attributes:- Classification, notation, dichotomy, class frequency, order of classes, positive and negative class frequencies, ultimate class frequencies, relation between class frequencies, consistency of attributes, (three attributes) Independence and association of two attributes, Yule's coefficient of association Q . Coefficient of colligation Y . Relation between them and problems.

Unit V:- National Income :- Definition, concepts of national Income, Gross national product (GNP), net national product (NNP), Personal Income, disposable income. per capita income, Gross domestic product (GDP), National income at market price. National income at factor cost, national income at current prices. national income at current prices. National income at constant prices, methods of estimation of national income. Output method. Income method, Expenditure method, Importance of national income. Difficulties in the calculation of national income.

Scope of Syllabus :-

(i) Fundamentals of Mathematical Statistics : S.C. Gupta V.K. Kapoor
(11 th Edition) Sultan chand and sons New Delhi.

Chapter10:- 10.1,10.2,10.3,10.4,10.4.1,10.4.2,
10.7,10.7.1,10.7.3, Theorem 10.1,10.2

Chapter 11:- 11.1,11.2,11.2.1,11.2.2,11.2.3

Chapter 13:- 13.2, 13.3,13.4,13.4.1,13.4.2,13.4.3,
13.5,13.5.1,13.6,13.7,13.7.1,13.7.2

(ii) Mathematical Statistics : Ray Sharma, Choudhari (Ramprasad and sons Agra)

Chapter 13 :- 13.2, 13.4, 13.5, 13.6, 13.12

(iii) Macro Economics :- M.L. Seth, Laxmi Narayan Agrawal Education
Publishers Agra - 3

Reference Books :

- i) Statistics : A Begineers Text volume I B.R. Bhat, T Shrivenkataramana,
K.S. Madhav Rao (New Age International Publications)
- ii) Descriptive Statistics : (first edition July – 2008) P.G. Dixit, Dr. V.R.
Prayag, D.L. Limaya (Nirali Publication Prakashan Pune).
- iii) Macro Economics Theory : – M.K. Jhingan, Vrinda Publications Pvt. Ltd.
New Delhi.

STATISTICS

B.A./ B.Sc. First Year

PRACTICAL - I

Paper-V

(Annual Practical)

Sr.No.	Title of the Experiments	No of Experiments
1.	Construction of Frequency distributions	2
2.	Bar Chart, Frequency polygon, Frequency Curve, Ogives Histogram. (Also using MS-EXCEL/Spread Sheet)	3
3.	Measures of central tendencies Mean, Median and Mode. (Also using MS-EXCEL/Spread Sheet)	3
4.	Compute Quartiles by analytical and graphical method	1
5.	Compute measures of dispersions Range, Quartile deviation, Mean deviation Standard deviation (Also using MS-EXCEL/Spread Sheet)	3
6.	Coefficient of Variation	2
7.	Moments	1
8.	Correlation coefficient (Results to be verified by using computer)	2
9.	Regression (Results to be verified by using computer)	2
10.	Spearman's rank correlatoin coefficient (For repeated and unrepeated ranks)	2
11.	Fitting of Binomial distribution	2
12.	Fitting of Poisson distribution	1
13.	Fitting of Curves (i) $Y = a+bx$ (ii) $Y = ab^X$ (iii) Second degree curve	2
14.	Attributes	3
15.	Computation of probabilities of bivariate distribution	1
16.	Most Plausible values of system of linear equations.	1

