

SEMESTER I
Descriptive Statistics and Probability
Subject Code: STA101

Units	Topics	Total Teaching Hours 60
I	<p>Introduction: Meaning, Definition, Importance and scope of Statistics. Basic concepts: Population, sample, variables and attribute. Measurement of scale: Nominal, ordinal, ratio and interval. Sources of data: Primary and secondary data. Classification and Tabulation. Diagrammatic and graphical representation: Bar diagram, pie charts, Histogram, Frequency polygon, Frequency curve, and Ogives.</p>	12
II	<p>Concept of central tendency: Arithmetic Mean, Geometric Mean, Harmonic Mean, Median and mode, their merits, demerits, properties and their applications. Partition values: Quartiles, Deciles and Percentiles.</p>	10
III	<p>Concept of Variation/Dispersion: Absolute & relative measures, various measures of dispersion: Range, Quartile deviation, Mean deviation & Standard deviation and its relative measures and their merits, demerits, properties and applications. Moments, skewness, Kurtosis and their measures.</p>	12
IV	<p>Probability: Random experiment, trail, sample space, sample point and events. Definition of equally likely, mutually exclusive and exhaustive events, complementary events, definition of probability: classical, relative frequency and axiomatic approach, properties of probability. Theorems of Probability: Addition theorem of probability, conditional probability, independence of events and multiplication theorem of probability, Baye's theorem and its application.</p>	14
V	<p>Index numbers: Index number- definition, uses, scope, limitations, computation of price and quantity index numbers, steps in the construction of Index number, criteria of ideal index numbers tests- TRT, FRT, circular test, consumer price index number- definition, and methods of computing consumer price index number.</p>	12

Books for Reference:

1. Agarwal. B. L. (2006), *Basic Statistics*, New age international (P) Ltd.
2. Hoel Poul. G., (1972) *Introduction to Mathematical Statistics*, Houghton Mifflin.
3. Gupta. S.C. and V. K. Kapoor, (2014), *Fundamentals of Mathematical Statistics*, Sultan Chand Publications.
4. Goon. A. M., Gupta. M. K. and Das Gupta. B. (1991), *Fundamentals of Statistics*, The Workspress, Calcutta.

STA 102

1. Presentation of data by frequency tables, diagrams and graphs.
2. Arithmetic Mean, Geometric mean, Harmonic mean, Weighted AM.
3. Median, Mode.
4. Partition Values.
5. Absolute and relative measure of dispersion.
6. Problems on moments, skewness and Kurtosis.
7. Computing Probability: Using addition and multiplication theorems.
8. Conditional probability and Baye's theorem.
9. Index Numbers- I
10. Index Numbers- II

First semester – Blue Print							
Descriptive Statistics and Probability							
Teaching Hours : 60							
Unit	Topics	Teaching Hours	Number of questions to be asked				
			2 Marks	5 Marks	10 Marks	Total Questions	Total Marks
I	Basic Statistics	12	2	1	1	4	19
II	Measures of central tendency	10	1	2	1	4	22
III	Concept of Variation & Dispersion	12	1	2	1	4	22
IV	Introduction to Probability theory	14	1	2	1	4	22
V	Index number	12	2	1	1	4	19
Total questions			7	8	5	20	104
To be Answered			5	6	3	14	70

SEMESTER II
Random variable, probability distributions, Correlation and
Regression
Subject Code: STA201

Units	Topics	Total Teaching Hours 60
I	Random Variable: Random variable, probability mass function, distribution function and their properties. Expectation of random variables and its properties. Measures of location, variation, moments in terms of expectation, skewness, kurtosis, moment generating function of random variable, their properties and uses for both discrete and continuous	16
II	Bivarite Distribution: Bivarite discrete and continuous distribution its pmf/pdf, marginal and conditional distributions. Bivarite Moments: Definition of raw and central product moments, conditional mean and conditional variance, covariance.	14
III	Standard Discrete Distribution: Uniform, Bernoulli, Binomial, Poisson, Geometric, Negative binomial, Hyper geometric distribution and their properties.	10
IV	Standard Continuous Distribution: Uniform, Normal, Beta, Gamma, Cauchy, Pareto distribution and their properties.	10
V	Correlation and Regression: Definition, Types of correlation, Scatter diagram, Karl Pearson's correlation coefficient and its properties (with proof), Definition and derivation of rank correlation coefficient and its properties, Regression and derivation of regression coefficient, Regression lines and their properties.	10

Books for Reference:

1. Goon. A. M., Gupta. M. K and Das Gupta. B. (1991): *Fundamentals of Statistics*, The World press, Calcutta.
2. Hogg. R. V., Mckean. J. W. and Craig. A.T. (2013): *Fundamentals of Statistics*, The World Press, Calcutta.
3. Hoel Poul. G., (1972) *Introduction to Mathematical Statistics*, Houghton Mifflin.
4. Gupta. S.C and Kapoor. V. K. (2014), *Fundamentals of Mathematical Statistics*, Sultan Chand publications.

STA202

1. Sketching distribution and density functions.
2. Computation of Expectation, moments and Moments generating functions.
3. Fitting of discrete distributions Binomial, Poisson, Negative Binomial Distribution.
4. Fitting of standard univariate distributions such as Normal, Exponential.
5. Computing marginal and conditional Probability distributions.
6. Computing marginal and conditional expectations.
7. Drawing random samples from bivariate Normal distribution.
8. Correlation and regression.

Second semester – Blue Print Descriptive Statistics and Probability Teaching Hours : 60							
Unit	Topics	Teaching Hours	Number of questions to be asked				
			2 Marks	5 Marks	10 Marks	Total Questions	Total Marks
I	Random variable and Expectation	16	2	2	1	5	24
II	Bivariate Distribution and moments	14	1	1	1	3	17
III	Standard Discrete Distribution	10	1	2	1	4	22
IV	Standard Continuous Distribution	10	1	2	1	4	22
V	Correlation and Regression	10	2	1	1	4	19
Total questions			7	8	5	20	104
To be Answered			5	6	3	14	70