



P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, Vijayawada – 520 010

Autonomous - ISO 9001 – 2015 Certified

Statistical Methods for Computer Applications

Offered to: BCA (Computer Applications) / 22STA35

Course Type: Core (TH)

Year of Introduction: 2021

Year of Revision:

Percentage of Revision:

Semester: III

Credits:

Hours Taught: 75 hrs. per Semester

Max. Time: 3 Hours

Course Prerequisites: Nil

Course Description

This course is an introduction to statistics for Bachelors of computer Applications. The objective of the course will be to learn to use statistical techniques to evaluate, interpret and quantify uncertainty. This will provide a basis for analysing and interpreting data from designing and conducting formal studies to reading magazine, journal and newspaper articles.

Course objectives:

- 1) To enable the students to develop basic knowledge in Statistics
- 2) To provide understanding in some basic statistical techniques which are used for Solving data science related problems.

LEARNING OUTCOMES At the end of the course, the student will

- 1) Understand the measurement systems variability
- 2) Find relationship between two quantitative variables
- 3) Measure relative changes in price, production or any such quantities of economic interest

S. No Programme Outcomes

- PO1** Remember the basic concepts of statistics at different levels and to understand them for gaining of knowledge.
- PO2** Apply the statistical techniques in the analysis of data and also acquire knowledge in optimization techniques.
- PO3** Facilitate students to acquire flair knowledge to estimate the values in real life problems.

Course Outcomes:

Course Outcome	Upon successful completion of this course, students should have the knowledge and skills to:	Programme Outcomes Mapping
CO 1	Develop the basic knowledge in Statistics and describe the central tendency value measurement	PO - 1
CO 2	Knowing the concept of variations and the significance of measuring it by Range, Quartile deviation, mean deviation variance and Standard deviation	PO - 1
CO3	Knowledge of various types of data, their organization and evaluation of summary measures such as non- central and central moments, measures of skewness and kurtosis.	PO - 1
CO 4	know about correlation and regression techniques, the two very powerful tools in statistics,	PO - 2
CO 5	Get the knowledge in respect of usage in day-to-day life in decision making in the face of uncertainty and also obtained the knowledge of probability applications	PO - 2

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	Introduction to Data & Central tendency Statistics for Computer Applications, Basic vocabulary of statistics, data collection, Types of Variables, Tables and diagrams and graphs for categorical and numerical data. Objectives of averages, characteristics of a good average. Arithmetic mean, Geometric mean, Harmonic mean, Median and Mode - merits, demerits, properties and applications.	15
II	Measures of Dispersion Significance of measures of dispersion, characteristics of an ideal measure of dispersion. Absolute and relative measures of dispersion-range, quartile deviation, mean deviation, variance and standard deviation- merits, demerits, properties and applications.	15
III	Moments Central & Non-Central moments. Relations between Central & Non-Central moments Skewness - Karl Persons' and Bowley's coefficients of skewness and coefficient of skewness based on moments. Kurtosis - Definition, measures and simple problems.	15
IV	Correlation and Regression Analysis Introduction- types of correlation, Scatter diagram technique, Karl Pearson's coefficient of correlation, and Spearman's rank correlation coefficient - merits, demerits properties and applications. Linear Regression Analysis – Introduction, Lines of regression, coefficients of regression – properties and applications.	15
V	Probability Definitions of various terms, Classical, Statistical and Axiomatic probability definitions and limitations. Addition theorem of probability. Conditional probability - definition, multiplication theorem of probability and Bayes' theorem (Statement only) – applications.	15

Note: Proofs and derivations of theorems are excluded.

Text Book:

S.C. Gupta, (2016), Seventh Edition, Fundamentals of Statistics, Mumbai: Himalaya Publishing House.

Reference Books:

1. Sharma, J. K. (2013), *Business statistics*, New Delhi: Pearson Education
2. Levine, D.M., Berenson, M. L. & Stephan, D. (2012), *Statistics for managers using Microsoft Excel*, New Delhi: Prentice Hall India Pvt.
3. Aczel, A. D. & Sounderpandian, J. (2011), *Complete Business Statistics*, New Delhi: Tata McGraw Hill.
4. Anderson, D., Sweeney, D., Williams, T., Camm, J., & Cochran, J. (2013), *Statistics for Business and Economics*, New Delhi: Cengage Learning.

5. Davis, G., & Pecar, B. (2014), *Business Statistics using Excel*, New Delhi: Oxford University Press.

Websites of Interest: <http://onlinestatbook.com/rvls/index.html>

Co-Curricular Activities in the class:

1. Pictionary
2. Case Studies on topics in field of statistics
3. Snap test and Open Book test
4. Architectural – To be build the procedures
5. Extempore – Random concept to students
6. Interactive Sessions
7. Teaching through real world examples

Model Question Paper Structure for SEE

Max.: 70 Marks

Min. Pass : 28 Marks

Statistical Methods for Computer Applications

Model Paper

Section - A

Answer the following

5 x 4M = 20Marks

1. (a) Briefly explain the principles of classification. (CO- 1, L – 1)
(OR)
(b) Explain briefly the various methods that are used for graphical representation of frequency distribution. (CO- 1,L – 1)
2. (a) Write down the Characteristics of an ideal measure of dispersion. (CO-2,L-1)
(OR)
(b) Calculate Standard deviation to the following data. (CO-2,L-1)
4, 8, 10, 15, 23, 24
3. (a) The first four moments of a distribution about the value 5 of the variable are 2, 20, 40 and 50. Calculate mean and variance. (CO-3,L-2)
(OR)
(b) Define skewness. Explain the measures of skewness. (CO-3,L-1)
4. (a) Define correlation and explain its types. (CO-4,L-1)
(OR)
(b) Write the properties and applications of regression lines. (CO-4,L-1)
5. (a) Define the following terms with examples: (CO-5,L-1)
(i) Mathematical Probability (ii) Statistical Probability (iii) Axiomatic Probability
(OR)
(b) What is the probability that a leap year selected at random will contain 53 Sundays?
(CO-5,L-2)

Section - B

Answer the following

5 x 10M = 50Marks

6. (a) Explain the types of collection of data. (CO-1, L- 2)
(OR)
(b) Calculate the mean, median and mode from the following data (CO – 1, L – 4)

Class interval	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	15	20	34	40	50	30	10

2. (a) Calculate mean deviation and standard deviation from the following data (CO – 2, L – 4)

Class interval	0-9	10-19	20-39	39-39	40-49	50-59	60-69
Frequency	5	7	10	12	18	10	6

(OR)

- (b) A biologist copy the results of his findings from his study and he found that mean and standard deviation of 28 results are respectively 46 and 8.1. In the verification process he found that two values (45, 61) are wrongly copied as (54, 16). Without making entire calculations find the corrected standard deviation. (CO – 2, L – 4)

3. (a) The first four moments of a distribution about the value 5 are -4, 22, -117 and 560.
Find the corresponding moments about the mean, about zero and also find β_1 and β_2

(CO – 3, L – 4)

(OR)

- (b) The standard deviation of a symmetrical distribution is 5. What must be the value of the fourth moment about the mean in order that the distribution be (i) leptokurtic, (ii) mesokurtic and (iii) platykurtic ?

(CO – 3, L – 4)

4. (a) Calculate the correlation coefficient from the following data.

(CO – 4, L – 4)

X	23	28	36	41	10	20	35	24	21	18	50
Y	19	21	24	16	15	18	22	16	12	30	25

(OR)

- (b) From the following data estimate the value “Y” when X = 30 and X when Y = 25

(CO – 4, L – 4)

X	21	18	26	21	10	20	15	14	21	18	25
Y	19	21	24	16	15	18	22	16	12	30	25

5. (a) The content of urns I, II and III are as follows

1 white, 2 black and 3 red balls

2 white, 1 black and 1 red balls and

4 white, 5 black and 3 red balls

One urn is chosen at random and two balls are drawn. They happen to be white and red. What is the probability that they come from the urns I, II and III? (10M)

(CO – 5, L – 4)

(OR)

- (b) The probability that a student passes a Physics test is $\frac{2}{3}$ and the probability that he passes both a Physics test and an English test is $\frac{14}{45}$. The probability that he passes at least one test is $\frac{4}{5}$. What is the probability that he passes the English test?

(CO – 5, L – 4)
