DEPARTMENT OF STATISTICS
MULTIDISCIPLINARY COURSE SYLLABUS

Multidisciplinary Course: Statistics for All

Course Title & Code	Credit Distribution of The Course			Eligibility Criteria	Prerequisite(s) of the Course (if any)
	Lecture	Tutorial	Practical / Practice		
Statistics for All	3	0	1	10 + 2 from a recognized board in any stream	Basic Mathematics, Observation and Analytical Skills

I.   Learning Objectives

On completion of this course, the student will be able

LO-1.   Acquire knowledge of introductory statistics, its scope andimportance in various areas such as Medical, Engineering, Agricultural and Social Sciences, Biology etc.

LO-2.   Learn various types of data, their organization, visualization and classification.

LO-3.   Learn presentations of data in tabular form and graphs.

LO-4.   Understanding paired data along with different types of association-measures and exploring cause-effect relation through the study of linear regression.

LO-5.   Acquire knowledge of statistical inference through some standard testing problems.

II.   Course Outcomes

At the end of the course, the students will be able to

CO-1   Scrutinize an arbitrary data set.

CO-2   Represent the data in tabular and diagrammatic form.

CO-3   Prepare the frequency and Bivariate Frequency distribution for qualitative and quantitative data.

CO-4   Gain valuable insights on correlation and regression.

CO-5   Frame null-hypothesis and Alternative hypothesis and write conclusion based on test.

III.   Course Content

UNIT – 1:   Univariate data (10L)
1. Variable, notion of population and sample, different types of data.
2. Methods of collecting primary and secondary data, presentation of data.
3. Measures on data with central tendency (primarily arithmetic mean, median, mode).
4. Dispersion (primarily range, quartile deviation, standard deviation, coefficient of variation).
5. Ideas of skewness and kurtosis (through diagrams only).

UNIT – 2:   Bivariate data (15L)
1. Paired data and ideas (without mathematical details) of different measures of associations, primarily Pearson's correlation coefficient, Spearman's Rank correlation.
2. Measures of association of attributes through contingency table.
3. Two-variable linear regression, linear regression (without derivation of the regression coefficients' formulae).

UNIT – 3:   Statistical Inference (testing of hypothesis) (15L)
1. Basic idea of normal population (primarily graphically, derivation of the properties excluded)
2. Concepts of hypotheses, knowledge on test statistic and decision making in terms of critical value and p-value for some standard testing problems like test of mean based on single (normal) sample.
3. Test on comparing means based on two-sample, and paired sample data, etc.

UNIT – 4:   Activities based on above units (20L)
1. Case study.
2. Report writing.
3. PPT presentation.
4. Computing all above topics using Excel.

IV.   References

1. Agresti, A. (2010): Analysis of Ordinal Categorical Data, 2nd Edition, Wiley.
2. Anderson T.W. and Jeremy D. Finn (1996). The New Statistical Analysis of Data, Springer.
3. Freedman, D., Pisani. R and Purves. R. (2014), Statistics,4th Edition W. W. Norton & Company.
4. Gupta, S.C. (2018), Fundamental of Statistics, Himalaya Publishing House, 7th Edition.
5. Gupta S.C. and V.K. Kapoor (2020), Fundamental of Mathematical Statistics, Sultan Chandand Co. 12th Edition.
6. Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I & II, 8th Edn. The World Press, Kolkata.
7. Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.
8. Mood, A.M. Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics, 3rd Edn., (Reprint), Tata McGraw-Hill Pub. Co. Ltd.