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| Programme/Class: Certificate | Year: First | Semester: Second |
| Subject: STATISTICS (Minor) | | |
| Course Code: -B060101T | Course Title: Descriptive Statistics (Bivariate) | |

Course outcomes: After completing this course a student will have:

- ✓ Knowledge describe experimental of the method of least squares for curve fitting to theoretically parameters associated data with a function or equation and to find the with the model. Knowledge of the concepts of correlation and simple linear regression and Perform correlation and regression
- ✓ Ability analysis. to interpret results from correlation
- ✓ Ability to and regression. compute and interpret
- ✓ rank correlation...

Credits:04

Core: Compulsory

Max. Marks: 25+75

Min. Passing Marks:.....

Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0.

| Unit | Topic | No. of Lectures |
|------|-------|-----------------|
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Descriptive Statistics (Bivariate)

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| I | Bivariate data, Principles of least squares, Most plausible values, logarithmic, of curve fitting, Fitting of straight line, parabola, least squares. power curves and other simple forms by method of least squares. | 08 |
| II | Bi-Variate frequency table, Correlation, Types of relationships, properties. diagram, Karl-Pearson's Correlation Coefficient and its | 08 |
| III | Rank correlation and its coefficient (Spearman and Kendall Measures) for Regression X and analysis through both types of regression equations for X and Y Variables. | 08 |
| IV | Attributes: Notion and Terminology, Contingency table, Class frequencies and Ultimate class frequencies, Consistency, Association of Attributes, Independence, Measures of association Tschuprow's for 2X2 table, Chi-square, Karl Pearson's and Coefficient of Association. | 08 |

Suggested Readings:

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

B. (2011), Fundamental of Statistics, Vol II, World Press, Kolkata.

Sultan Gupta, Chand S.C. and and Kapoor, V.K. (2000). Fundamentals of Mathematical Statistics (10th ed.), Calculus Based Approach. Sons.

Hanagal, D. D. (2009). Introduction to Applied Statistics: A Non- Narosa Publishing Comp. New Delhi.

Miller, I. and Miller, M. (2006). John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia. 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.

Weatherburn, Book C.E. (1961). A First Course in Mathematical Statistics, The English Lang. Society and Cambridge Univ. Press.

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| Programme/Class: Certificate | Year: Second | Semester: Fourth |
| Subject: STATISTICS (Minor) | | |
| Course Code: -B060201T | Course Title: Testing of Hypothesis and Tests of significance | |

Course outcomes:

After completing this course a student will have:

- ✓ Knowledge of the terms like null and alternative hypotheses, two-tailed and one tailed alternative hypotheses, significant and insignificant, level of significance and confidence, p value etc.
- ✓ Ability to understand the concept of MP, UMP and UMPU tests
- ✓ Ability to understand under what situations one would conduct the small sample and large samples tests (In case of one sample and two sample tests).

Credits:04

Core: Compulsory

Max. Marks: 25+75

Min. Passing Marks:.....

Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0.

| Unit | Topic | No. of Lectures |
|--|---|-----------------|
| Testing of Hypothesis and Tests of Significance | | |
| I | Statistical Hypothesis (Simple and Composite), Testing of hypothesis. Type-I and Type-II errors, Significant level, p-values | 08 |
| II | Power of a test, Definition of Most Powerful (MP), Uniformly Most Powerful (UMP) and Uniformly Most Powerful Unbiased (UMPU) tests. | 08 |

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| III | Test of significance: Large sample tests for (Attributes and Variables) proportions and means (i) for one sample (ii) for two samples Correlation coefficient in case of (a) $\rho = \rho_0$ (b) $\rho_1 = \rho_2$, | 08 |
| IV | Small sample test based on t, f and chi-square distributions. | 08 |

Suggested Readings:

Ferund J.E (2001): Mathematical Statistics, Prentice Hall of India.

Freedman, D., Pisani, R. and Purves, R. (2014). Statistics. 4th Edition. Norton & Comp.

Goon, A.M., Gupta, M.K. & Dasgupta, B. (2002). Fundamentals of Statistics, Vol. 1., Kolkata, The World Press.

Gupta, S.C. and Kapoor, V.K. (2000). Fundamentals of Mathematical Statistics (10th ed.), Sultan Chand and Sons.

Hangal, D. D. (2009). Introduction to Applied Statistics: A NonCalculus Based Approach. Narosa Publishing Comp. New Delhi.