**EduPM-702 Statistics in Education**

**Objectives**

After studying the course, the students will be able to:

* Comprehend the basic concepts of statistics;
* Understand the statistical concepts more frequently applied in Education and other social sciences
* Apply various statistical techniques in analyzing research data in Education and other social sciences
* Apply appropriate statistics in qualitative and quantitative researches
* Understand the advanced concepts of statistics especially multivariate analysis

**Course Outline**

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| --- | --- | --- | --- |
| **Unit-1:**  **Unit:2:** | **Introduction to statistics**  **Inferential Statistics** | | |
|  |  | | Concept of Inferential Statistics |
|  |  | | Parametric versus Non-parametric Tests |
|  |  | | Hypothesis Testing |
|  |  | | Level of Significance |
|  |  | | Types of Error |
| **Unit-3:** | **Comparing Measures of Central Tendency between Groups** | | |
|  |  | Differences between Groups | |
|  |  | Comparing a Single Group | |
|  |  | Comparing Two Groups | |
|  |  | Comparing Two or More Groups | |
|  |  | Paired or Dependent Measures | |
|  |  | Two-way ANOVA | |
|  |  | Factorial Analysis of Variance | |
| **Unit-4:** | **Correlation and Regression** | | |
|  |  | Correlation | |
|  |  | Properties of Correlation Co-efficient | |
|  |  | Factors Affecting Correlation | |
|  |  | Multiple Correlation Co-efficient | |
|  |  | Scatter Plots | |
|  |  | Cronbach's Alpha | |
|  |  | The Regression Line | |

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| **Unit-5:** | **Probability and Distribution of Sample Means** | |
|  |  | Concept of Probability |
|  |  | Probability and the Normal Distribution |
|  |  | The Distribution of Sample Means |
|  |  | Probability and the Distribution of Sample Means |
| **Unit-6:** | **Tests for Ordinal Data and Nominal Data** | |
|  |  | Spearman’s Correlation |
|  |  | Tests for Nominal Data |
|  |  | Chi-Square Goodness-of-Fit |
|  |  | Chi-Square Independence |
|  |  | Cochran’s Q |
|  |  | Phi or Cramer’s V (Correlations for Nominal Data) |

**Multivariate Analysis**

**Unit-7: Introduction**

* Introduction to Multivariate statist number, nature, and combination of variable In Multivariate statistics.
* The Data Matrix
* The Correlation Matrix
* The variance –covariance Matrix
* The sum of squares and crocs-Production Matrix
* Residuals

**Unit-8: Data preparation: screening data prior to Analysis**

* Accuracy of Data file
* Honest Correlations
* Missing data Analysis
* Outlines
* Normality
* Exploratory Factor Analysis

**Unit- 9: Multiple Regressions**

* General purpose and Description
* Kinds of Research Question
* Limitation to Regression Analysis
* Fundamental Equations for Multiple Regressions

**Unit- 10: Discriminate Analysis**

* General Purpose and Description
* Kind of research Question
* Limitation to Discriminate Analysis
* Fundamental Equation for Discriminate Analysis
* Types of Discriminate Function Analysis
* Issues of Discriminate Analyses.

**Unit-11: Logistic Regressions**

* General purpose Descriptions
* Kinds of Research Question
* Limitation to logistic Regression Analysis
* Fundamental equations for logistic Regression
* Types of logistic Regression
* Issues of logistic Regression

**Unit-12:**  **Multivariate Analysis of Analysis of Variance & Covariance MANCOVA.**

* General Purpose and Description
* Limitation to Multivariate Analysis of Variance (MANOVA) & MANCOVA
* Fundamental Equations for multivariate Analysis of variance
* Issues of MANOVA

**Suggested Readings:**

Cohen, L. Manion, L. and Morrison, K. (2007) *Research methods in education* (5th edition). London: Routledge.

Dunn, D. S., Smith, R. A, and Beins, B. C. (2007) *Best practices in teaching statistics and research methods in the behavioral sciences.* Lawrence Erlbaum Associates.

Gravetter, F. J. and Wallnau, L. B. (2004) *Statistics for the behavioural sciences* (6th edition). USA: Thomson and Wadsworth.

Greenacre, M. (2007) *Correspondence analysis in practice (2nd edition).* Chapman and Hall/CR.

Howell, D. C. (2007) *Statistical methods for psychology* (6th edition). USA: Thomson and Wadsworth.

Lomax, R. G. (2007). *An introduction to statistical concepts (2nd edition).* Lawrence Erlbaum Associates.