EDUCATIONAL STATISTICS& COMPUTER APPLICATIONS

Course Code: EDBE320   **Credit Hours: 3**

Course Description:

Educational researchers are facing very demanding research questions now which need to be explored to greater depth as compared to few decades ago. Statistical techniques are a tool for analysing the results in empirical research, which is increasingly used in present educational research. Understanding of such methods and techniques has become an integral part of conducting educational research. In order to apply these statistical techniques and procedures, proficiency to use computer is utmost important. This course is designed to provide not only the understanding of basic statistical concepts as they are used in educational research but It is also intended to develop the basic knowledge to use computers to conduct statistical procedures. Hence the contents of the course necessarily cover the contents in this regard. As a result of this course the participants will become better interpreters of educational data by mastering the statistical concept and techniques as well as proficient users of computer.

Learning Outcomes

At the end the course students will be able to:

1. understand descriptive statistics
2. differentiate different test of statistics
3. use statistical test in educational research
4. interpret result of data analysis
5. explore new techniques in statistics research purpose

Contents

1. **Introduction to statistics**

   1.1 Introduction

   1.2 Basic concepts

   1.3 Historical development of statistics

   1.4 Types of Measurement Scale

2. **Frequency distributions and graphs**

   2.1 Introduction

   2.2 Frequency distributions

   2.3 Introduction to graphs

   2.4 Graphs for qualitative variables

   2.5 Graphs for quantitative variables

   2.6 Shapes of distributions

3. **Measures of central tendency** -

   3.1 Introduction

   3.2 Mean

   3.3 Median

   3.4 Mode

4. **Measures of dispersion, skewness, and kurtosis**

   4.1 Introduction to measures of dispersion

   4.2 Measures of dispersion (Range, Quartile Deviation, Standard Deviation, variance)

   4.3 Dispersion and the normal distribution

   4.4 Skewness and kurtosis

5. Correlation
   5.1 Introduction to correlation
   5.2 Pearson Product-Moment correlation coefficient
   5.3 Spearman Rank correlation
   5.4 Other kinds of correlation coefficients

6. **Statistical inference: one sample**
   6.1 Introduction to hypothesis testing
   6.2 One-sample t-test for a mean

7. **Statistical inference: two samples**
   7.1 Introduction to hypothesis testing for two samples
   7.2 Two- sample t test and confidence interval for means using independent & dependent samples

8. **Introduction to the analysis of variance and covariance**
   8.1 Introduction to analysis of variance
   8.2 Basic concepts in ANOVA
   8.3 Multiple comparison procedures

9. **Statistical inference for frequency data**
   9.1 Chi-Square test
   9.2 Testing Goodness of Fit
   9.3 Testing independence

10. **Statistical Inference for Ranked Data**
    10.1 Introduction to Assumption-Free tests
    10.2 Mann- Whitney U Test for two independent samples
    10.3 Wilcoxon test for dependent samples

11. **Introduction to computers**
    11.1 Introduction
    11.2 Computers' use in society and future needs
    11.3 Computers' types
    11.4 Data & Informatics

12. **Introduction to basic components of Computer**
    12.1 What is hardware
    12.2 Hardware devices
    12.3 What is software
    12.4 Software devices
    12.5 Input devises
    12.6 Output devices

13. **Computers in education**
    13.1 CAI
    13.2 Packages used for CAI
    13.3 Computer Managed Learning CML

14. **Computer Lab Practices**
    14.1 Working with MS Word
    14.2 Working with MS Excel
    14.3 Working with MS Power Point
    14.4 Working on SPSS

Teaching-learning Strategies

The instructional strategies will focus on constructionist learning approach. These strategies will be diverse in line with the course contents. Therefore, these strategies will include but not limited to demonstration, cooperative learning, collaborative learning, teacher and student-led discussion, individual and group presentations, reflective practices and classroom activities.

Assessment and Examinations

The students will be assessed according to the following criteria.

Examination	Marks Distribution
Sessional work	25 %
Mid Semester	35%
Final Semester	40%

Suggested Readings

Bartz, A.E. (1999). Basic statistical concepts (4[th]ed.). New Jersy: Printice-Hall

Bluman, A. G. (2009). Elementary statistics: A step by step approach. Boston: McGraw-Hill. Garrett, H. E. (1995).*Statistics in psychology and education*. London: Longman

Heiman, G. W. (2011). *Basic statistics for the behavioural sciences*. USA: Wadsworth

Howel, D. C. (2013).*Statistics for psychology*. USA: Wadsworth

Howel, D. C. (2011).*Fundamentals of statistics for behavioural sciences*. USA: Wadsworth

Kutz, A. K. (1980). *Statistical method in education and psychology*. New Delhi, Narosa publishing House.

Larson, R., & Farber, B. (2012).*Elementary statistics: Picturing the world*. Delhi: Prentice Hall.

Mangal, S.K. (2002).*Statistics in psychology and education*. New Delhi: Printice-Hall of India Pvt. Ltd.

Weiss, N.A. (2012). *Elementary statistics*. Boston: Addison-Wesley