Instructional Technology for Teaching Statistics

Course code: EDBER357 **Credit Hours: 3**

Course Description

Computer application of statistics course is a basic introductory statistics course offered at our institution. The Contents includes descriptive statistics, probability, random variables, sampling distributions, inferential statistics and regression analysis. After completing the course, students should be able to recognize and apply these concepts in specific cases. Although no statistics or calculus class is required or assumed of students who take this course.

Learning Outcomes

On successful completion of the course, prospective teachers/novice researchers will be able to:

1. Understand the importance and use educational statistics.
2. Know that how statistics can be taught through instructional technology
3. Understand about different technological applications used in statistics
4. Differentiate between different statistical procedures
5. Know about how computers can be used in statistics
6. Understand that how it is assessed by using technology

1: Introduction to Statistics

1.1. Basic Terminology
1.2. Role of Statistics in Educational Research
1.3. Variables and Constant
1.4. Population and Sample
1.5. Data Structures, Research Methods, and Statistics
1.6. Random Sampling
1.7. Statistical Notation

2: Selection among Statistical Procedures

2.1. Descriptive Statistics
2.2. Inferential Statistics
2.3. Applied Statistics
2.4. Variables and Constants
2.5. Parameter and Statistics
2.6. Scales of Measurement

3: Statistics and Computer

3.1. Using Computers in statistics
    3.1.1. Coding data
    3.1.2. Defining variables
    3.1.3. Entering data
    3.1.4. Findings frequencies, mean, median
    3.1.5. Draw bar graph
    3.1.6. Applying t-test, ANOVA
3.2. Do Statistics Lie?
3.3. Some Tips on Studying Statistics

4: Technology and Statistics

4.1. Introduction
4.2. Need of Technology in Statistics
4.3. Integration of Technology in Statistics
4.5. The Role of Technology in Improving Student Learning of Statistics
4.6. Importance of technology in student learning
4.7 Obstacles to Incorporating Technology in the Statistics
4.8. Recommendations for Using Technology in Teaching Statistics

5: Technological Tools: Teaching of Statistics and Probability

5.1. Statistical Software Packages
5.2. Educational Software
5.3. Spreadsheets
5.4. Applets/Stand-alone Applications
5.5. Graphing Calculators
5.6. Multimedia Materials
5.7. Data and Materials Repositories

6: Assessment of Using Technology for Teaching Statistics

6.1 General Approaches for Assessing Instructional Technology
6.2 Efforts to Assess Internet-based Instructional Technologies

Teaching-Learning Strategies
Hands-on-learning
Demonstration
Cooperative learning
Lectures
Text-based readings
Project-based learning
Technology-based assignments
Technology portfolio
Assignments preparation and presentations

Assessment
Mid-term: 35%
Formative*: 25%
Final assessment: 40%

** Attitude towards learning and participation in classroom activities/discussion will specifically be focused. All semester system rules of IER/PU will be observed.*

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

Chance, B., Ben-Zvi, D., Garfield, J., & Medina, E. (2007). *The Role of Technology in Improving Student Learning of Statistics*. Retrieved frhttps://escholarship.org/content/qt8sd2t4rr/qt8sd2t4rr.pdf.

Coladarci, T., & Cobb, C. D. (2013). *Fundamentals of statistical reasoning in education* (4th ed.). US: Jay O'Callaghan.

Einspruch, E. L. (2005). *An introductory guide to SPSS for windows* (2nded). London: Sage Publications.

Howell, D.C. (2011). *Fundamental statistics for the behavioral sciences* (7thed). Wadsworth: Cengage Learning.

Howell, D.C. (2014). S*tatistical methods for psychology* (8thed). Wadsworth: Cengage Learning.

King, B. M., Rosopa, P. J., & Minium. E. W. (2011). *Statistical reasoning in the behavioral science* (6th ed). US: John Wiley & Sons, Inc.

Pallant, J. (2010). *SPSS survival manual: A step by step guide to data analysis using SPSS* (4thed). New York: McGraw-Hill Education.

Rade, L., & Sweden, G. (1990). *Statistics and the computer.* Retrieved from https://iase-web.org/documents/papers/icots3/BOOK1/C8-2.pdf

Ravid, R. (2011). *Practical statistics for educators* (4thed). US: Rowman & Littlefield Publishers, Inc.

Rowell, G. H. (2004). *Assessment of Using Technology for Teaching Statistics.* Retrieved from http://www.rossmanchance.com/artist/proceedings/rowell.pdf