

Description of “Advanced Statistics”

Information			
Administering Department	Remote Sensing	College	Remote Sensing & Geophysics College
Course Leader	Sajeda Kareem Radhi	e-mail	sajeda.kareem@kus.edu.iq
Course Leader's Acad. Title	Assistant Professor		
Scientific Committee Approval Date	15 / 9 /2024	Version Number	1.0

Course Description

This course covers the major topics of descriptive and inferential statistics. Course content includes the basic procedures of choosing and conducting appropriate statistical tests for a given research or business problem. Students should gain a strong foundation in inferential statistics, including z-tests, t-tests, ANOVA, Chi-Square, Linear Regression and other Non-Parametric tests used in assessing the presence of an effect under investigation.

As stated in the approved study plan, this course includes different topics in the field to using statistical methods and help the student to solve problems, process data and test hypotheses distributions of data, sampling size and multivariate model, factor analysis .

Learning Objectives

After careful study of this chapter you should be able to do the following:

1. Identify the role that statistics can play in the science education problem-solving process
2. Discuss how variability affects the data collected and used for making educational research decisions
3. Explain the difference between enumerative and analytical studies
4. Discuss the different methods that scientist use to collect data
5. Identify the advantages that designed experiments have in comparison to other methods of collecting science education data
6. Explain the differences between mechanistic models and empirical models .
7. Discuss how probability and probability models are used in science.
- 8- Identify distribution .
- 9- Test hypotheses .
- 10- Understanding the regression and correlation .

Course Learning Outcomes	Upon successful completion of this course, students will be able to: After completing this course, Students should be able to identify distributions and identify area under the curve confidence intervals, z and t test, chi-squares test, understand the hypotheses testing and find the critical value. They also Should be able to understand and apply the correlation and regression, coefficient of determination, and multiple regression using the one-way ANOVA and Scheffe test, nonparametric statistics why used multivariate analysis when you used, what time series analysis and factor analysis, exploratory and confirmatory examples to explain the methods.
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Advanced Statistics Syllabus	
Week 1	• Types of Data • Collecting Sample Data
Week 2	• Frequency Distributions • Histograms
Week 3	• Measures of Center
Week 4	• Measures of Variation
Week 5	• Moments • Skewness • Kurtosis
Week 6	• Correlation tests • Pearson's correlation
Week 7	• Spearman's-rank correlation
Week 8	• Regression
Week 9	• Discrete Probability Distributions • Binomial Probability Distributions • Poisson Distributions
Week 10	• Normal Probability Distributions • The standard Normal Distributions
Week 11	• Hypothesis Testing

Week 12	• Analysis of Variance
Week 13	• Chi-Square tests
Week 14	Project Presentations
Week 15	Pre-final exam

Learning and Teaching Resources		
	Text	
Required Texts	1. Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I & II, 8th Edn. The World Press, Kolkata. 2. Gupta, S. C. and Kapoor, V.K. (2008): Fundamentals Of Mathematical Statistics, 4th Edition (Reprint), Sultan Chand & Sons	
Recommended Texts	1. Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia. 2. 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.	
Websites		