KINGDOOM OF SAUDI ARABIA		المملكة العربية السعودية
King Saud University		جامعة الملك سعود
Deanship of Common First Year		عمادة السّنة الأولى المشتّركة
Department of Basic Sciences		قسم العلوم الأساسيّة

Syllabus and Contents of Course for First Semester 1445

COURSE NAME: INTRODUCTION TO PROBABILITY AND STATISTICS. **COURSE NUMBER: STAT 101**	**CREDIT HOURS: 3 HOURS** **ACTUAL HOURS: 4 HOURS**
Head of the Department: Dr. Abdulrahman Alzahrani **E-mail: chair-math@cfy.ksu.edu.sa**	**Office: 2562** **Phone: 94070**
Course Coordinator: Prof. Dr. Hamid Al-Oklah **E-mail: stat140@cfy.ksu.edu.sa**	**Office: 2469** **Phone: 94582**
Textbook: Introduction to Probability and Statistics, Sixth Edition, 2022. **Authors: Abouammoh A., Sultan K., Kayid M. and Sharahili M.**	

Some References:

1-Nicholas, Jackie. Introduction to Descriptive Statistics. Mathematics Learning Centre, University of Sydney, 1990.

2-Samules, M.L., Witmer, J.A and Schaffner, A., Statistics for the Life Sciences. Fourth edition, Pearson, New York, 2012.

3-Walpole, R.E., Myers, R.H. and Myers, S.L. and Ye, K., Probability and Statistics for Engineers and Scientists, Ninth Edition, Prentice, New York, 2012.

Contents:

Getting and Organizing Statistical Data: Basic Concepts and definitions, Samples, Variables, Organizing of Raw Data and its Representation, Frequency Distributions and its Representation- and the Forms of Frequency Distributions.

Measures of Position for Data: Measures of Central Tendency, Quartiles, Deciles and Percentiles, The Fife Numbers and the Representation of Data by Box Plot.

Measures of Variation: Measures of Dispersion, Coefficients for Compare two or more of Data sets and the z-standard score.

Linear Correlation and Regression: Person's Coefficient of Correlation and the Straight for the simple Linear Regression.

Random Experiments and the Probability of Events: Mathematical Concepts for Probability Calculation, Space of Elementary Event, Algebra of Events, Some Operations on Events, Probability Function and its Properties, Conditional Probability and the Independence of Events.

Random Variables and Their Probability Distributions: Concept of Random Variable, Probability Distribution Function of a Random Variable, Discrete Random Variables, Mathematical Expectation and Variance of a Discrete Random Variable, Continuous Random Variables, Mathematical Expectation and Variance of a Continuous Random Variable and the Standardization of a Random Variable.

Introduction to Statistical Inference: Estimator of a Parameter, The Central Limit Theorem, Point Estimation, Interval Estimation, Confidence Intervals, Statistical Hypothesis, Hypotheses Testing for the Population Mean and Hypotheses Testing for the Population Proration.

Linear Correlation and Regression: Person's Coefficient of Correlation, Coefficient of Determination and the Straight for the simple Linear Regression.

Goals: In this course

a) The student will able to understand some statistical concepts and using there.

b) The student will able to classify the variables and data in to quantitative qualitative.

c) The student will able to compute some measurements of central tendency, determine some position measurements and their representation on Box Plot diagram.

d) The student will able to compute some measurements of dispersion, determine some measurements which used for compare the variation between two (or more) sets.

e) The student will able to determine the space of elementary events of some random experiment, compute the probability of events which dependent on a random experiment, understanding the conditional probability, using the total probability formula and Bayes formula in probability calculation.

f) The student will able to understand the concept of the random variable and its probability distribution, types of the random variables, computing the mean and standard deviation of discrete random variable, the meaning of continuous random variable, understanding applications of uniform, exponential and normal distributions.

g) The student will able to understand the concept of the point and interval estimation for a parameter of population, determine the confidence interval for a parameter of population, understanding the concept of the test hypothesis and perform testes for parametric hypotheses.

h) The student will able to calculate Pearson's simple linear correlation coefficient, determination the straight linear regression (type *Y* on *X*) according to the lest square method.

Important Instructions:

1- Absence shall be counted from the first day until the last day preceding the final exams for the semester.

2- If the student delayed more than ten minutes of the lecture is absent, and if the presence during the first ten minutes register late.

3- The student is deprived of the final exam if the percentage of absenteeism exceeded **25%** of the hours of attendance approved for teaching.

4- The student is evaluated during the semester based on:

- **a)** Two paper home works, each with five degrees (**5** + **5** = **10**),
- **b)** Four electronic home works with a score of **10** degrees,
- **c)** Discussions and activity with a score of **5** degrees
- **d)** A midterm exam with a score of **25** degrees,
- **e)** A final exam with a score of **50** degrees.

Course Schedule and Contents:

Chapter	Week	Required	Examples	Exercises for Students
----------	Week 0	**Induction Program**	----------	----------
Chapter One DESCRIPTIVE STATISTICS	Week 1	Explanation of the Crocker plan for the course 1.0- Introduction. 1.1- Basic Concepts and Dentitions.	All examples	1, 2, 3, 4, 5, 6-a, 7, 8-a, 9, 10, 11-a, 13-a-b, 25-a-b, 26-a-b, 27.
	Week 2	1.2- Organizing the Data. 1.3- Graphical Representation of the Data.	All examples	
	Week 3	1.4- Measures of Central Tendency (Mean, Median and Mode).	All examples	6-b-c, 8- b-c-d-e, 12-d-e, 13-c, 14, 15-a, 16, 17, 19, 20, 21, 22-a, 23-a, 25-c.
	Week 4	1.4- Measures of Central Tendency (Percentiles, Deciles, … up to the end of this section).	All examples	
	Week 5	1.5- Measures of dispersion, Coefficient of Variation and *z*-scores.	All Contents	11-b, 12-a-b-c, 15--b-c, 18, 19, 22-b-c-d, 23-b-c-d, 24, 26-c.
Chapter Two PROBABILITY	Week 6	2.1- Mathematical Concepts. 2.2- Definitions and Concepts in Probability Calculus.	All examples	1, 2, 3, 4, 5, 6,
	Week 7	2.3- Concept of Probability Function. 2.4- Conditional Probability and Independence of Events.	All examples	7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23.
Chapter Three RANDOM VARIABLES AND PROBABILITY DISTRIBUTIONS	Week 8	3.1- Concept of Random Variables and Their Distributions. 3.2- Discrete Random Variables and Their Distributions.	All examples	1, 2, 5, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 28, 29, 30, 31.
	Week 9	3.3- Continuous Random Variables and Their Distributions.	All examples	18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 32, 33, 34, 35, 36, 37.
Chapter Four INTRODUCTION TO STATISTICAL INFERENCE	Week 10	4.1- Definitions and Concepts. 4.2- Estimation of the Population Mean.	All examples	1, 2, 3, 4, 5, 6, 7, 10, 24-a, 26, 27, 28.
	Week 11	4.3- Estimation of the Population Proportion. 4.4- Introduction to Hypotheses Testing.	All examples	8, 9, 11, 12.
	Week 12	4.5- Hypotheses Testing for the Population Mean. 4.6- Hypotheses Testing for the Population Proportion.		13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24-b, 25.
----------	Week 13	**Mid-semester break**	----------	----------
Chapter Five CORRELATION AND REGRESSION	Week 14	5.1- Linear Correlation Coefficient.	All examples	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13.14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26.
	Week 15	5.2- Simple Linear Regression.	All examples	