The UNIVERSITY of JORDAN
Faculty of Science   *Department of Mathematics*

COURSE DESCRIPTION
Principles of Statistics MATH 131
09/10/2022

Instructor:

Office Hours:

Text Book: Elementary Statistics PICTURING THE WORLD GLOBAL EDITION, SEVENTH EDITION, by Ron Larson, Pearson.
Recommended References:
- *Introduction to Probability and Statistics*, 14th Edition, by W. Mendenhall, R. Beaver and B. Beaver, 2013, Brooks/Cole Publisher, USA.

- *Statistics: Principles and Methods*, 3rd Edition, by R. A. Johnson and G. K. Bhattacharyya, 2014, John Wiley, New York, USA.

Prerequisite: NONE.

Description: This course is aimed at providing students with the basic concepts of statistics, statistical techniques for different types of data and problems, and the spirit of their applications.

Lecture Schedule (Tentative):
  1- Introduction to statistics(Ch.1):   (1 week)
         1.1-   An overview of statistics (Q: 1-20, 25, 34, 35, 42-44).
         1.2-   Data classification (Q: 1-6, 7, 10, 13, 15, 18, 20, 27, 29).
2- Descriptive Statistics (Ch.2):   (3 week)
   2.1-   Distribution tables, histograms, polygons, Ogives. (Q: 1-11, 15, 19, 21, 25).
   2.2-   Stem and leaf plot, Dot plot, Scatter plot, Pie chart, Pareto chart and time series chart. (Q: 1-4, 9, 11, 15, 16, 27, 30, 31).
   2.3-   measures of centrality Mean, Median, and Mode, Weighted Mean and Mean of Grouped Data. The Shapes of Distributions and outliers. (Q: 1-17, 31, 33, 35, 41, 43, 51, 57, 59).
   2.4-   Range, Variance and Standard Deviation, Interpreting Standard Deviation, Standard Deviation for Grouped Data, Coefficient of Variation, Emperical rule and Chebushev's theorem. (Q: 1-11, 14, 17-19, 21-23, 29, 35, 43, 45, 51, 53, 54).
   2.5-   Measures of position: Quartiles, Percentiles and Other Fractiles. The Standard Score, box-and-whisker plot. (Q: 1-11, 13, 19-22, 29-32, 41, 49) .

  3- Elements of Probability (Ch.3):   (2 week)

   3.1- Basic concepts of probability: Probability Experiments, The Fundamental Counting Principle, Types of Probability, Complementary Events, Probability Applications, Sample space and events, basic laws of probability. (Q: 1-10, 25-32, 34, 36, 39, 53-56, 73, 81, 87, 88)

   3.2- Conditional Probability, Independent and Dependent Events, The Multiplication Rule, Bayes' Theorem (Q: 1-8, 10, 13, 14, 19, 22, 27, 33, 39, 41, 42).

3.3- Mutually Exclusive Events. The Addition Rule . A Summary of Probability.(Q: 1-13, 15, 19, 23).

3.4- Permutations. Combinations. Applications of Counting Principles. (Q: 1-6, 12, 14, 19-24, 43, 50, 55,)

4- Random Variables and Distributions (Ch.4):   (2 week)
Random variables, probability distribution, expectations and its properties, variances, binomial, and Poisson distributions
(4.1: Q: 1-10, 13-18, 19, 25, 27, 29, 35, 36, 39).
(4.2: Q: 1, 2, 11, 15, 19, 25, 31).
(4.3: Q: 27, 31, 32).

5- Normal Distribution (Ch.5):   (1 week)

Normal distribution, normal approximation to binomial distribution, the central limit theorem, Sampling Distribution.

 (5.1, Q: 1-16, 19, 22, 54, 56).

(5.2, Q: 1, 6, 7, 13) .

(5.3, Q: 18, 20, 22, 23, 27, 29, 31, 38, 41, 42).

(5.4, Q: 1, 5-8, 15, 19, 29, 41, 42).

(5.5, Q: 9-14, 17, 19, 31, 32).

6- Confidence Interval (Ch.6):   (1 week)

Confidence Intervals for the Mean (σ Known), Confidence Intervals for the Mean (σ unknown), Confidence Intervals for Population Proportions, Confidence Intervals for Variance and Standard Deviation.

(6.1, Q: 1-8, 17, 21, 32, 33, 35, 47, 59).

(6.2, Q: 1, 5, 9, 13, 17, 35, 41).

(6.3, Q: 1-7, 11, 17, 20, 29, 36, 37).

(6.4, Q: 1-3, 9, 13, 17, 23).

7- Hypothesis testing (Single Population) (Ch.7)   (1 week)

Introduction to Hypothesis Testing, Hypothesis Testing for the Mean (σ Known), Hypothesis Testing for the Mean (σ Unknown), Hypothesis Testing for Proportions, Hypothesis Testing for Variance and Standard Deviation .

(7.1, Q: 1-16, 21-24, 25, 29, 31, 32, 37, 40, 43, 53-56).

(7.2, Q: 1-9, 15, 16, 19, 22, 24, 27, 31, 37, 43, 44).

(7.3, Q: 1-9, 12, 14, 16, 18, 19, 27, 31).

(7.4, Q: 1-7, 13, 19, 20).

(7.5, Q: 1-5, 14, 15, 2 ,22, 23,).

8- Hypothesis testing (Two Populations) (Ch.8):   (1 week)
Testing the Difference Between Means (Independent Samples, σ_1 and σ_2 Known), Testing the Difference Between Means (Independent Samples, σ_1 and σ_2 Unknown), Testing the Difference Between Means (Dependent Samples), Testing the Difference Between Proportions.
(8.1, Q: 1-8, 15, 25, 27, 29).

(8.2, Q: 1- 5, 9, 12, 13, 23, 25, 26).

(8.3, Q: 1-5, 9, 23).

(8.4, Q: 1-4, 6, 7, 13 23, 24).

Grading Policy: The final grade will be calculated as follows:

-      First Exam: 30%
-      Second Exam: 30%
-      Final Exam: 40%