

## COURSE DESCRIPTION

*Principles of Statistics MATH 131*

**Summer 2019 /2020**

**Textbook:** Principles of Statistics, 4<sup>th</sup> Edition, M. Raqab, A. Awad and M. Azzam, 2016, Academic for Publishing and Distributing Co (RAA).

[متوفر في شركة الأكاديميون للنشر-شارع الملكة رانيا العبدالله، مكتبة وائل، مكتبة الجامعة]

### 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*, 3<sup>rd</sup> Edition, by R. A. Johnson and G. K. Bhattacharyya, 2014, John Wiley, New York, USA.

### Course Outline

This course is aimed at providing students with the basic concepts of statistics and probability , statistical inference techniques for different types of data and their applications in various fields.

#### Lectures Schedule (from (RAA) .textbook) :

- 1- Descriptive Statistics (RAA, Ch.1): Random versus Nonrandom Phenomena, Qualitative and Quantitative data, Frequency Tables, relative frequency , histograms, polygons, skewness, outliers, measures of centrality and variability for raw and grouped data, percentiles, inter-quartile range, coding data, Chebychev and Empirical Rules . (3 weeks).
- 2-Elements of Probability (RAA, Ch.2): Sample spaces and events for random phenomena , probability laws for events , union and intersection of events, event complement, rules of counting; conditional probability, Independent and mutually exclusive events , Bayes' Theorem (2 weeks).
- 3-Random Variables and Distributions (RAA, Ch.3): Discrete and continuous random variables, probability distribution for random variable, expectations and its properties, variance of random variable, Binomial distribution and its mean and variance (2 weeks).
- 4-Normal Distribution (RAA, Ch.4): Normal distribution and its percentiles, normal approximation to binomial distribution, distribution of the sample mean and the central limit theorem (1 week).
- 5-Sampling Distributions (RAA, Ch.5): Sampling distribution of the sample mean, of the sample variance and of the sample proportion, Student t-distribution, sampling distribution for the difference between two sample means and two sample proportions ,Statistical Tables (1 week).
- 6- Statistical Inferences (Single Population) (RAA, Ch.6 &Ch.7): Null and alternative hypotheses, estimation (point/ interval) and testing for the population mean, proportion, variance, Types I and II errors, P-value , determination of sample size for estimating the mean and the proportion error margin, (3 weeks).
- 7- Statistical Inferences\* (Two Populations) (RAA, Ch.8): Estimation (point/interval) and testing the difference between two means, two proportions, paired comparisons for dependent samples , pooled variance (2 weeks).

**Grading Policy::** First Exam: 20% . Second Exam: 15% . Third Exam :15% . Final Exam: 50%

\* If time permits