Course Specifications

General Information

Course name	Principles of Statistics
Course number	MATH2209
Faculty	
Department	
Course type	College Needs
Course level	2
Credit hours (theoretical)	2
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - To select and differentiate between sampling methods, and to determine the sample size.

2 - To construct and read the frequency tables and statistical charts.

3 - Explain, calculate, and interpret descriptive statistics including scales of measurement, frequency distributions, measures of central tendency and measures of dispersion .

4 - To understand the characteristics of probability distributions, with concentration on the application of Binomial, Poisson and Normal distributions.

5 - To obtain and interpret the correlation coefficients and simple linear regression model.

6 - To understand the basic concepts of inferential statistics including sampling distribution, confidence intervals, and hypothesis testing.

Intended Learning Outcomes

Knowledge and Understanding	* Understand the basic concepts and terminology of statistics, including types of variables and measurement scales
	* Understand the central tendency and dispersion measures.
	* Understand the concepts of classical probability.
	* Understand selected discrete (Binomial, Poisson) and continuous distributions (Normal Distribution)
	* Know scatter diagram.
	* Understand the central limit theorem
	* Understand the importance and basic principles of estimation.
Intellectual Skills	* Select processes involved in the scientific method and the design of experiments
	* Interpret the central tendency and dispersion measures.
	* Interpret the values of probability
	* Explain the similarities and differences between distributions
	* Differentiate between relationships types.
	* Differentiate between correlation and regression.
	* Interpret a confidence interval from a practical and a probabilistic viewpoints.
	* Understand the logic of hypothesis testing and interpretation of p values
Professional Skills	* Select samples from a population of subjects.
	* Organize and display data
	* Calculate the measures of central tendency and dispersion
	* Calculate the probability of an event
	* Calculate probabilities in real-life problems.
	* Calculate correlations among variables.
	* Obtain a simple linear regression model and use it to make predictions.
	* Construct a sampling distribution of a statistic and apply the central limit theorem
	* Construct interval estimates for location parameters
	* State a null and alternative hypothesis and carry out a structured hypothesis test.
General Skill	* Appreciate the advantages of using computers in the statistical analysis of data
	* Communicate with statistical figures effectively,
	* Making decisions
	* Team work

Course Contents

1 - Introduction to statistics and sampling
2 - Descriptive statistics
3 - Some basic probability concepts
4 - Popular probability distributions
5 - Correlation and regression
6 - Sampling distributions
7 - Introduction to statistical inference

Teaching and Learning Methods

1 -	Lectures
2 -	Discussion
3 -	Solving problems and exercise
4 -	Applications on computer using statistical software packages.

Students Assessment

Assessment Method	TIME	MARKS
First mid-term exam	Week 8	30%
Second mid-term exam / Quizzes	Week 12	10%
Homework and project reports	Week 13 and 14	10%
Final exam	Week 16	50%

Books and References

Course note	Abuzaid, A. H. (2012). Principles of Statistics, Department of Mathematics, Al Azhar University-Gaza
Essential books	Mann, P.S. (2010). Introductory Statistics. John Wiley & Sons Canada, Ltd 7th ed.
Recommended books	MOORE, D. S, McCABE, G. P. and CRAIG, B. A. (2007) Introduction to the Practice of Statistics, W. H. Freeman and Company, New York
	DANIEL, W. W. and CROSS, C. L. (2013). BIOSTATISTICS A Foundation for Analysis in the Health Sciences. John Wiley & Sons, 10th Ed..

Knowledge and Skills Matrix

Main Course Contents	Study Week	Knowledge and Understanding	Intellectual Skills	Professional Skills	General Skill
INTRODUCTION TO STATISTICS AND SAMPLING	2	Understand the basic concepts and terminology of statistics, including variables types and measurement scales	Select processes involved in the scientific method and the design of experiments	Select samples from a population of subjects.	Appreciate the advantages of using computers in the statistical analysis of data
DESCRIPTIVE STATISTICS	3	Understand the central tendency and dispersion measures	Interpret the central tendency and dispersion measures.	Organize and display data -Calculate the measures of central tendency and dispersion	Communicate effectively with statistical figures.
SOME BASIC PROBABILITY CONCEPTS	2	Understand the concepts of classical probability.	Interpret the values of probability	Calculate the probability of an event	
PROBABILITY DISTRIBUTIONS	2	Understand selected discrete (Binomial, Poisson) and continuous distributions (Normal Distribution)	Explain the similarities and differences between probaility distributions	Calculate probabilities in real-life problems.	
CORRELATION AND REGRESSION	2	Know scatter diagram.	Differentiate between types of relationships. Differentiate between correlation and regression.	calculate correlations among variables. -obtain a simple linear regression model and use it to make predictions.	
SAMPLING DISTRIBUTIONS	1	Understand the central limit theorem Know some popular sampling distributions	Implement the central limit theorem	construct a sampling distribution of a statistic.	
INTRODUCTION TO STATISTICAL INFERENCE	2	understand the importance and basic principles of estimation.	Interpret a confidence interval from both a practical and a probabilistic viewpoint. - Interpret p values	* Calculate interval estimates for a variety of parameters * state a null and alternative hypothesis and carry out a	making decision