Future Academy
Higher Future Institute for Specialized Technological Studies
Course Specification

1- Course information:

Course Code:	BSC106
Course Title:	Probability and Statistics
Year/level	1st
Academic Programs	Computer Science Program (B.Sc.)
Contact hours/ week	(Theoretical = 2hrs / Tutorial =2hrs), Total =4hrs

2- Course aims:

This course aims to provide students to carry out the basic concept of probability. And statistical skills for advanced work in the functional areas of data science and analytics.

3- Intended learning outcomes of the course (ILOs):

a- Knowledge and understanding:

On successful completion of this course, the student should be able to:
a1. recognize the fundamental probability and statistics concepts, principles and theories necessary for computer science.
a2. utilize the appropriate mathematical tools and understanding of the concepts of probability.

b- Intellectual skills:

On completing this course, the student should be able to:
b1. realize and evaluate the statistical techniques to solve big problems dedicated for computer science.
b2. compare between different statistical methods.
b3. classify the different statistical approaches used in computing thinking.

c- Professional and practical skills:

At the end of this course, the student will be able to:
c1. handle a large amount of data, and come up with results.
c2. use technological repositories, internet resources, and library-based materials to acquire a variety of basic research skills in statistics and probability.

d- General and transferable skills:

On successful completion of this course, the student should be able to:
d1. display the skills (think logically and critically to solve problems, explain conclusions, and evaluate evidence or critique the thinking of self and others) necessary to manage one's learning.
d2. demonstrate abilities in work effectively as a member of a development team.

d3. respect the ethical, legal, and social responsibilities of scientist teamwork.

4- Course contents

Week No.	Topics/units	Number of hours		ILO's
		Lecture hours	Tutorial hours	
1	Sets and elementary Probability	2	2	a1, a2, b1,b2, c1, d1
2	Conditional Probability, Multiplicative rule	2	2	a1, a2, b1,b2,c1, d1
3	Independence and conditional independence	2	2	a1, a2, b1, b2. c1, d1
4	Random variables+ Quiz1	2	2	a1, a2, b1, b3, c1, d1
5	Mathematical expectation & variance	2	2	a2, b2, b3, c1, d1
6	Correlation covariance	2	2	a1, a2, b1, b2, c2, d2
7	Midterm Exam	2	2	a1, a2, b1. b2. b3, c1, d1,
8	Discontinuous probability Distributions, Binomial Distribution	2	2	a1,a2, b2, c1, d1
9	Discontinuous probability Distributions, Poisson Distribution	2	2	a1,a2, b1,b2, c1,c2 d1
10	Discontinuous probability Distributions, Hypergeometric.	2	2	a1,a2, b2, c1, d1
11	continuous probability Distributions, Uniform distribution , exponential distribution + Quiz 2	2	2	a1, a2, b1, b3, c1, c2, d1
12	continuous probability Distributions, Normal distribution	2	2	a1, a2, b1, b3, c1, c2, d1
13	Joint probability	2	2	a1, a2, b1, b3, c1, c2, d1
14	Bayes theorem and prediction	2	2	a1, a2, b1, b3, c1, c2, d1, d2

5- Teaching and learning methods

Methods	ILO's																			
	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	c1	c2	c3	c4	c5	d1	d2	d3	d4	d5
Lectures	√	√				√	√	√			√	√				√	√	√		
Tutorial / Practical sections																				
Self-learning																				
Assays and reviews	√	√				√	√	√			√	√				√	√	√	√	√
Discussion groups																				

Brainstorming																			
Blended-learning																			
E-learning																			

6- Teaching and learning methods for Low-achieving students

- Extra teaching hours for those who need help
- More quizzes to assess their ability for understanding the course
- Encourage the team work for those students with other advanced ones to increase their participation and understanding

7- Student assessment

Assessment method	Time	Grade weight (%)	Week	ILOs
Course Work (Tutorial Exercise and Assignments)		15	Every week	a1,a2, b1, b2, b3, c1, c2,
Quiz 1		5	Week#4	a1,a2, b1, b2, b3, c1, c2,
Mid-term exam		15	Week#7	a1,a2, b1, b2, b3, c1, c2,
Quiz 2		5	Week#11	a1,a2, b1, b2, b3, c1, c2,
Final Written exam		60		a1,a2, b1, b2, b3, c1, c2,

8-List of references

8.1. Student notebooks:

Comprehensive instructor notes are available on the course web page (google Classroom).

8.2. Essential textbooks:

- Statistical Techniques in Business, Lind Marchal, 2021.

8.3. Recommended textbooks:

- Schaum's Outline of Statistics, Sixth Edition, Larry J Stephens and Murray R. Spiegel, 2018.

8.4. Journals, Periodical and Reports ……..etc.

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8.5. Websites

- STatistics Education Web (STEW)

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