كلية الحاسبات والذكاء الإصطناعي
Faculty of Computers & Artificial Intelligence

Templates NO (12)

2019 / 2020

University	Helwan
Faculty	Computers and Artificial Intelligence
Department	Information Systems – Software Engineering Program

Course Specifications

1- Course Data		
Code: ST 121	**Course Name:** Probability and statistics - 1	**Level:** 2nd level
Specialization: Software Engineering Program	**No of Learning Units:** (2) **Theoretical** (1) **Practical**	

2- Course Objective:	The course should acquire the students the fundamental knowledge and concepts of: 1. Recognize random phenomena. 2. Identify the basic notations and concepts of probability and statistics. 3. Connect between set theory and probability theory. 4. Distinguish between discrete and continuous random variables. 5. Clarify the basic properties of density and distribution functions. 6. Express some natural phenomena as a probability model. **7.** Derive the mean, the variance and moment generating function for some important distributions.

3- Intended Learning Outcomes (ILOs)	
A. Knowledge and Understanding:	On successful completion of this course the student will be able to: a1. Identify the sample space, random events, probability and conditional probability concepts. a2. Explain the importance of independence concept in probability. a3. Recognize discrete and continuous distributions. a4. Discuss the basic properties for probability distributions. Knowledge of some basic multivariate statistical distributions.
B. Intellectual Skills:	On successful completion of this course the student will be able to: b1. Prove some of the important theorems in probability. b2. Compute the measures of central tendency and dispersions. b3. Calculate probabilities, conditional probabilities for different events. Ability to formulate a multivariate problem as such.

C. Professional and Practical Skills:	**At the end of the course, the student will be able to:** c1. Demonstrate the practical importance for some probability distributions. c2. Apply probability and statistical models to improve data reading. c3. Select suitable statistical methods to solve daily life problems. Being able to make estimates from multivariate data.
D. General and Transferable Skills:	**The student will gain generals skill that make him capable of:** d1. Demonstrate self-learning in solving assignments in this course. d2. Acquire the skills of extracting information from data. d3. Ability to select appropriate approach to a problem.
4- Course Content:	1- Descriptive statistics. 2- Sample space. 3- Probability axioms. 4- Combinational techniques. 5- Conditional probability. 6- Independence and Bayes theorem. 7- Random variables. 8- Distribution functions. 9- Moments and generating function. 10- Some probability distributions. 11- Joint distribution. 12- Chebyshev's inequality and the law of large numbers. 13- The central limit theorem and sampling distribution. 14- Random processes. 15- Correlation and estimation.
5- Learning and Teaching Methods:	5.1. Lectures. 5.2. Data show presentation. 5.3. Web-sites recommendations. 5.4. Self-learning. 5.5. Solving additional problems in practical hours.
6- Learning and Teaching Methods for students with limited skills:	6.1. One to one tutoring during office houres. 6.2. Tailored assignment. 6.3. Joining to working groups. 6.4. Giving them more excercies.
7- Students Evaluation:	
A. Used Methods	- Written Exams. - Quiz. - Reports.
B. Schedule	- Assessment 1: Reports. 5th week - Assessment 2: Written Exam (Midterm) 7th week - Assessment 3: Quiz exam 4th week & 12th week - Assessment 4: Written Exam (Final) depends on the exam schedule

C. Grades Distribution	- Mid-term examination	20 % = 20/100
	- Quiz	10 % = 10/100
	- Reports	10 % = 10/100
	- Final exam	60 % = 60 /100

List of Books and References:	
A. Notes:	- Course notes prepared by staff.
B. Mandatory Books:	- Mathematical Statistics with Applications. Seventh Edition, Dennis Wackerly, William Mendenhall and Richard L. Scheaffer (2008). Thomson Learning.
C. Suggested Books:	- Probability and Statistical Inference. Ninth Edition, Robert V. Hogg, Elliot A. Tanis and Dale L. Zimmerman (2015). Pearson Education.
D. Periodicals & Websites	- www.Eviews.com - www.Minitab.com - www.datacamp.com - JASA

Course Professor: *Dr. Mohammed Yusuf*

Chairman of the Scientific Department: