MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Statistics and Probability			**Module Delivery**	
Module Type				☒Theory ☒Lecture ☐Lab ☐Tutorial ☐Practical ☒ Seminar	
Module Code	MU010602205				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	1		**Semester of Delivery**	4	
Administering Department	Computer Science		**College**	College of Science	
Module Leader	Muna Jaafar Raheem		**e-mail**	munmnmun@uomustansiriyah.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	MSc.	
Module Tutor	Hazim Michman Trao		**e-mail**	hazimmichman@uomustansiriyah.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	15/04/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This course will introduce the studies of the probability theory and statistics, with an emphasis on solving problems in computer science. Probability and statistics is an important foundation for computer science fields such as machine learning, artificial intelligence, computer graphics, randomized algorithms, image processing, and scientific simulations. Topics in probability include basic ideas in probability, Conditional Probability , Bayes' theorem, Independent Events ,discrete random variables, probability distributions, Special Discrete Random Variables , Bernoulli , Binomial and Poisson Random Variable. Topics in statistics include sample mean and variance, Estimating the Variance of a Normal Distribution, the sample correlation coefficient, and hypothesis testing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The Outcomes of this course Upon successful completion is that the students will have gained the necessary understanding on: 1. - laws of probability theory and its applications. 2. -Evaluate combination and permutations. 3. -use of Bayes' theorem. 4. - concept of Independent Events. 5. -concept of random variables. 6. - probability distributions and their properties. 7. -concept of sampling – concept of hypothesis testing. 8. -practical implementation of some of the probability and statistics concepts.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. This course is an introductory text on a number of topics in statistics and probability, intended primarily for students undertaking a first degree in computer science. 2. The material of this course has been divided into three chapters covered on 15 weeks. 3. The basic areas covered: probability ,the sample statistics. 4. Each chapter begins with a clear statement of pertinent definitions, principles and theorems together with illustrative. 5. This is followed by sets of solved problems. The solved problems serve to illustrate and amplify the theory.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Active Learning: Encouraging students to actively engage with the material through activities such as problem-solving, group discussions, and hands-on projects. 2. Visualization: Using visual aids such as graphs, charts, and diagrams to illustrate statistical concepts and relationships 3. Real-World Examples: Providing real-world examples and applications of statistical concepts to help students understand how statistics is used in various fields such as science, business, and social science. 4. Technology Integration: Incorporating technology such as statistical software, simulation tools, and online resources into the learning process.. 5. Problem-Based Learning: Presenting students with real-world problems or case studies that require the application of statistical concepts to solve. 6. Assessment and Feedback: Providing regular opportunities for students to assess their understanding of the material through quizzes, assignments, and exams.. 7. Collaborative Learning: Encouraging collaboration among students through group projects, peer teaching, and collaborative problem-solving activities.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	3 and 10	LO #1, #2, #8
	Assignments	3	10% (10)	2 ,7 and 11	LO #1, #2 ,#3,#4, #5,#6,#8
	Projects / Lab.				
	Report	1	10% (10)	13	All
Summative assessment	Midterm Exam	2hr	10% (10)	15	All
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Basic Ideas in Probability, Sample spaces ,Events ,The Algebra of Events ,Axioms of Probability,
Week 2	Counting Outcomes ,Permutations
Week 3	Combinations , Quiz#1
Week 4	Conditional Probability ,Independent Events
Week 5	Discrete Random Variables
Week 6	Joint distributions ,Independent random variables ,Conditional distributions
Week 7	Expectation ,Variance and Standard Deviation ,Covariance
Week 8	Special Discrete Random Variables ,The Bernoulli Random Variable,
Week 9	The Binomial Random Variable ,The Poisson Random Variable
Week 10	Quiz#2,Sample Statistics, The Sample Mean, The Sample Variance
Week 11	Estimating the Variance of a Normal Distribution ,Samples from Finite Populations
Week 12	The Sample Correlation Coefficient
Week 13	Regression , Simple linear regression
Week 14	Maximum Likelihood Estimators ,Hypothesis Testing
Week 15	Midterm Exam #
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Schaum's Outline Series " Probability and Statistics" Third Edition، Murray R. Spiegel, John J. Schiller, R. Alu Srinivasan, the McGraw-Hill Companies Inc,2009.	Yes
Recommended Texts	"Probability and Statistics for Computer Science" David Forsyth، Urbana, IL, USA , Copyright ,2018	No
Websites	https://doi.org/10.1007/978-3-319-64410-3	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors
	C - Good	جيد	70 – 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.