



University of Fallujah
College of Information Technology
Department of Cybersecurity

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Probability and Statistics		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CYS113		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	
Administering Department	Dept. of Cybersecurity	College	College of Information Technology
Module Leader	Mufeed Hameed Saleh	e-mail	Mufeed.h@uofallujah.edu.iq
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	MSc
Module Tutor	Mufeed Hameed Saleh	e-mail	Mufeed.h@uofallujah.edu.iq
Peer Reviewer Name	Dr. Ahmad A. AlSabhany	e-mail	Ahmad.alsabhany@uofallujah.edu.iq
Scientific Committee Approval Date	25-5-2026	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	1. To introduce students to the fundamental laws and principles of probability and statistics. 2. To enable students to organize, describe, and analyze data effectively. 3. To provide understanding of data distribution, variation, and correlation. 4. To develop the ability to compute and interpret measures of central tendency and dispersion. 5. To introduce the concepts of permutations, combinations, and counting principles. 6. To equip students with knowledge of probability rules, theorems, and common probability distributions. 7. To provide the foundation for further study in data analysis, engineering, and computer science applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the basic terminology and principles of probability and statistics. 2. Identify and classify data types, organize data, and present it graphically. 3. Apply the concepts of permutations, combinations, and basic counting rules. 4. Solve problems involving sample spaces, events, and probability laws. 5. Compute measures of central tendency and dispersion, and interpret their meaning. 6. Apply key probability distributions such as binomial, Poisson, and normal distributions. 7. Use correlation and regression to study relationships between variables. 8. Demonstrate understanding of sampling, estimation, and hypothesis testing. 9. Apply learned techniques in problem-solving and data-driven reasoning.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Statistics 1. Population, samples, and types of sampling. Random and continuous variables. (6) 2. Frequency distribution, data organization, and graphical representation (histograms, charts). (8) 3. Measures of central tendency: mean, median, mode. (8) 4. Measures of variation: range, variance, standard deviation, coefficient of variation. (10) 5. Correlation and regression analysis. (8) 6. Sampling, estimation, and confidence intervals. (10) 7. Hypothesis testing and data interpretation. (10) Part A – Statistics (65 hours) Part B – Probability 1. Fundamental concepts: sample space, events, probability rules. (6) 2. Venn and tree diagrams, addition and multiplication theorems. (6) 3. Counting principles: factorial, permutations, combinations. (8) 4. Conditional probability and Bayes' theorem. (8) 5. Discrete probability distributions: binomial, multinomial, Poisson. (10) 6. Continuous probability distributions: uniform, normal, exponential. (10)

	7. Applications and interpretation of probability models. (6)
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies الاستراتيجيات	The main teaching strategy involves interactive lectures, exercises, and practical examples to strengthen analytical and problem-solving skills. Students are encouraged to participate actively in discussions and to apply concepts through class activities, tutorials, and exercises. Visualization and numerical examples are used to clarify statistical and probabilistic concepts.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	32	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	18	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quiz	1	10% (10)	5	LO #1, #2, #3
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Quiz	1	10% (10)	12	LO #8, #9, #10
	Report	1	10% (10)	13	LO #5, #11 and #12
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Population, samples, random variables, and data organization.
Week 2	Frequency distribution and histograms.
Week 3	Measures of central tendency (mean, median, mode).
Week 4	Measures of variation (variance, standard deviation).
Week 5	Coefficient of variation, correlation, and regression.
Week 6	Introduction to probability, sample space, and events.
Week 7	Venn and tree diagrams, addition and multiplication theorems. + (Midterm Exam)
Week 8	Counting techniques: factorial, permutations, combinations.
Week 9	Conditional probability and Bayes' theorem.
Week 10	Discrete probability distributions – binomial and Poisson.
Week 11	Continuous distributions – uniform and normal.
Week 12	Exponential distribution and expected values.
Week 13	Sampling and estimation concepts.
Week 14	Hypothesis testing and data interpretation.
Week 15	Review and discussion
Week 16	preparation for final exam.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Walpole, R. E., et al. (2020). Probability and Statistics for Engineers and Scientists. 10th Edition. 2. Larson, R., & Farber, B. (2022). Elementary Statistics: Picturing the World. 8th Edition. 3. Montgomery, D. C., & Runger, G. C. (2018). Applied Statistics and Probability for Engineers.	Yes
Recommended Texts	1. Blom, G. (2019). Probability and Statistics: Theory and Applications. 2. Online educational resources for probability and statistics visualization and problem-solving.	No
Websites	https://www.khanacademy.org/math/statistics-probability https://www.itl.nist.gov/div898/handbook/	

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.				