

MODULE DESCRIPTION FORM

Module Information			
معلومات المادة الدراسية			
Module Title	Statistics and forensic applications		Module Delivery
Module Type	Basic		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	FOR23007		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2	Semester of Delivery	
Administering Department	Forensic Evidence	College	College of Science
Module Leader	Jasim Mohammed Ali	e-mail	-
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	Master's
Module Tutor	Jasim Mohammed Ali	e-mail	-
Peer Reviewer Name	Abbas Taher Jari	e-mail	Abbas.taher@uowa.edu.iq
Scientific Committee Approval Date	08/09/2026	Version Number	1.0

Relation with other Modules			
Prerequisite module	none	Semester	2/1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	<p>On completion of this module the learner will/should be able to;</p> <ol style="list-style-type: none"> 1. Describe basic statistical terms which are of relevance to the area of forensic science. 2. Graphically display and numerically summarise data using appropriate tables, graphs and measures of centre, spread and position. 3. Explain and apply concepts of basic probability including, conditional probability, Bayes' theorem, independent events and counting formulae; 4. Make inferences about population parameters using sample statistics using confidence interval estimates and tests of statistical hypotheses 5. Describe the application of statistics to sampling, quality control, analytical method validation and experimental design. 6. Use an appropriate method for analysing relationships between variables in a dataset
Module Learning Outcomes	<p>Students who successfully complete this unit will be able to:</p> <ol style="list-style-type: none"> 1. Explain basic concepts in probability as they apply to random events and uncertain evidence, and update probabilities when additional information is obtained 2. Apply probability theory to games of chance, forensic science, and DNA profiling 3. Identify appropriate applications of binary and multinomial regression and apply these models to forensic problems 4. Compare different models for a survival analysis and apply these to forensic science problems 5. Conduct cluster analyses, particularly in typical forensic science settings, and explain the differences between various clustering methods 6. Compare different classification techniques, and apply these to problems in forensic science settings
Indicative Contents	<ol style="list-style-type: none"> 1. Describe basic statistical terms which are of relevance to the area of analytical science Introduction to Statistical Terms Populations and Samples Data Types Introduction to Sampling Methods [12h] 2. Graphically display and numerically summaries data using appropriate tables, graphs and measures of center, spread and position. <p>Graphical Representation of data including frequency tables and charts</p> <p>Measures of Central Tendency, Position and Dispersion. [12h]</p>

	<p>3. Explain and apply concepts of basic probability including, conditional probability, Bayes' theorem, independent events and counting formulae;</p> <p>Probability Experiments</p> <p>Probability Trees</p> <p>Classical Probability</p> <p>Experimental Probability</p> <p>Addition and Multiplication Rules of Probability</p> <p>Counting Rules</p> <p>Bayes Theorem</p> <p>Discrete Probability Distributions</p> <p>Binomial Distribution</p> <p>Poisson Distribution</p> <p>The Normal Distribution</p> <p>Applications of the standard Normal Distribution</p> <p>Assessing Normality</p> <p>The Central Limit Theorem [10h]</p> <p>4. Make interferences about population parameters using sample statistics using confidence interval estimates and tests of statistical hypotheses</p> <p>Introduction to Hypothesis Testing</p> <p>Writing hypotheses for statistical tests</p> <p>One Sample, Independent Samples and Paired Samples t-tests</p> <p>One-Way ANOVA and related Post Hoc Tests</p> <p>Repeated Measures ANOVA and related Post Hoc Tests</p> <p>z-tests for proportion size</p> <p>5. Describe the application of statistics to sampling, quality control, analytical method validation and experimental design Sample Size Calculations Quality of Analytical Measurements</p> <p>Uncertainty</p> <p>Method Validation.</p> <p>Calibration Methods</p> <p>Experimental Design and Optimisation [12h]</p> <p>6. Use an appropriate method for analysing relationships between variables in a dataset Relationship Modelling</p> <p>Pearson's Correlation Co-efficient</p> <p>Significance of the correlation co-efficient</p>
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	<p>Simple Linear Regression Chi Square test for association</p> <p>Chi Square test of goodness of fit</p> <p>During the Practical element of the course, students will use the Data Analysis ToolPak in Microsoft Excel to carry out the various types of analysis listed in the syllabus above. [12h]</p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>The teaching methods used will be a combination of lectures, self-study, labs, tutorials, and any combination of discussion, case study, problem-solving exercises and computer-based learning.</p> <p>The practical element of the course will be delivered separately to students in their various class groups Forensic Science so that the examples used in the practical application of statistics can be tailored to their field of study.</p>

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	48	Structured SWL (h/w)	3.2
Unstructured SWL (h/sem)	2	Unstructured SWL (h/w)	3
Total SWL (h/sem)	75		

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

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Introduction to the concept of statistics
Week 2	The importance of statistics and its relationship to other sciences and its fields of application
Week 3-4	The main stages of the statistical process: the interpretation of the number of words, all the data and information, and the link between the data And tabulating it, displaying the data, calculating indicators or parameters for the data, interpretation and prediction
Week 5	The meaning of statistics and criminal statistics 1
Week 6	The meaning of statistics and criminal statistics 2
Week 7	exam
Week 8	The importance of criminal statistics in the security operation
Week 9	Sources of criminal statistics: prison statistics, judicial statistics, police statistics
Week 10	The importance of forensic statistics and its benefits
Week 11	Obstacles to criminal statistics
Week 12	Fundamentals of developing criminal statistics
Week 13	Methods for predicting crime rates
Week 13-14	A brief overview of the use of the SPSS system in forensic statistical analysis
Week 15	Exam
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly tut. Syllabus)

المنهاج الأسبوعي للمختبر

	Material Covered
Week 1	The importance of statistics and its relationship to other sciences and its fields of application
Week 2-3	The main stages of the statistical process: the interpretation of the number of words, all the data and information, and the link between the data And tabulating it, displaying the data, calculating indicators or parameters for the data, interpretation and prediction
Week 4	Sources of criminal statistics: prison statistics, judicial statistics, police statistics
Week 5	Obstacles to criminal statistics
Week 6	Methods for predicting crime rates
Week 7-8	A brief overview of the use of the SPSS system in forensic statistical analysis

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Lovrich, N.P., Pratt, T.C., Gaffney, M.J., Johnson, C.L., Asplen, C.H., Hurst, L.H., and Schellberg, T.M. (2004). National Forensic DNA Study Report, Final Report. Pullman: Washington State University.	Yes
Recommended Texts	National Academies of Sciences, Engineering, and Medicine. 2015. Support for Forensic Science Research: Improving the Scientific Role of the National Institute of Justice. Washington, DC: The National Academies Press. https://doi.org/10.17226/21772 .	No
Websites	https://www.sussex.ac.uk/webteam/gateway/file.php?name=sewp161.pdf&site=25	

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.