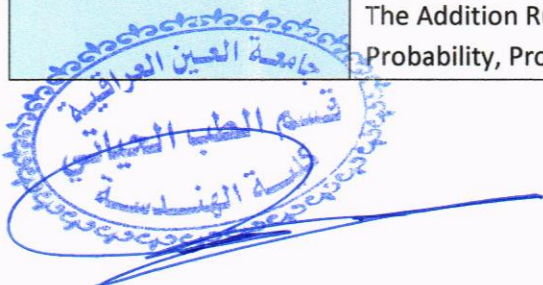


MODULE DESCRIPTION FORM

Module Information				
Module Title	Statistics and Probability		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	CERSTA			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	3	Semester of Delivery		6
Administering Department	Biomedical Engineering		College	College of Engineering
Module Leader			e-mail	
Module Leader's Acad. Title	Asst. Lec.		Module Leader's Qualification	MSc
Module Tutor	Hussam Wheed Maktooff		e-mail	hossam.waheedmaktouf@alayen.edu.iq
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date			Version Number	1.0

Relation with other Modules				
Prerequisite module	Engineering and Numerical Analysis(CERMAT5)		Semester	5
Co-requisites module	NON		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Introduction, to the concepts of statistics, Organize data using a frequency distribution, Histograms, Frequency Polygons, and Ogives, Measures of Central Tendency Mean, Measures of Central Tendency Median, Mode, and other measures, Tutorial, Measures of Position, Percentiles, Deciles, and Quartiles, Measures of Variation, Mean Deviation, Standard Deviation, Variance, and Range, Measures of Position, Standard Score (Z-score), Classical definition of Probability, The Addition Rules for Probability, The Multiplication Rules and Conditional Probability, Probability and Counting Rules



Module Learning Outcomes	<table> <tr> <td data-bbox="456 188 580 517">Knowledge</td><td data-bbox="580 188 1479 517"> A2 A2.1: define basic statistical concepts, including data types, variables, population, sample, and descriptive statistics. A2.2: Identify various methods of data collection, such as surveys and experiments, and recognize the importance of appropriate sampling. A2.3: Use statistical software (such as R, Python, or SPSS) to perform practical data analysis and visualization. A2.4: Analyze the relationships between variables by building and interpreting simple and multiple regression models. </td></tr> <tr> <td data-bbox="456 517 580 815" rowspan="2">Skills</td><td data-bbox="580 517 1479 645"> B1 B1.1 Function efficiently as an individual B1.2 Function as a member of multidisciplinary and multicultural teams </td></tr> <tr> <td data-bbox="580 645 1479 815"> B2 B2.1 Communicate effectively – graphically with a range of audiences using contemporary tools. B2.2 Communicate verbally and in writing with a range of audiences using contemporary tools. </td></tr> <tr> <td data-bbox="456 815 580 1048">Ethics</td><td data-bbox="580 815 1479 1048"> C1 C2.1 Recognize professional and ethical responsibility. C1.2 Adhere and respect diversity. </td></tr> </table>	Knowledge	A2 A2.1: define basic statistical concepts, including data types, variables, population, sample, and descriptive statistics. A2.2: Identify various methods of data collection, such as surveys and experiments, and recognize the importance of appropriate sampling. A2.3: Use statistical software (such as R, Python, or SPSS) to perform practical data analysis and visualization. A2.4: Analyze the relationships between variables by building and interpreting simple and multiple regression models.	Skills	B1 B1.1 Function efficiently as an individual B1.2 Function as a member of multidisciplinary and multicultural teams	B2 B2.1 Communicate effectively – graphically with a range of audiences using contemporary tools. B2.2 Communicate verbally and in writing with a range of audiences using contemporary tools.	Ethics	C1 C2.1 Recognize professional and ethical responsibility. C1.2 Adhere and respect diversity.
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Ethics	C1 C2.1 Recognize professional and ethical responsibility. C1.2 Adhere and respect diversity.							
Indicative Contents	Indicative content includes the following. Unit 1: Understanding Basic Statistical Concepts, Fundamentals (Introduction to Statistics), Presentation of Statistical Data Apply statistical methods Data Collection and Sampling, Interpret and communicate statistical results [8 hours]. Unit 2: Understanding of probability concepts, including basic principles, conditional probability, independence, Critical, Thinking and Interpretation Discrete Probability Distributions [8 hours]. Unit 3: Critically evaluate statistical information Continuous Distribution, probability concepts, including basic principles, conditional probability, independence, Hypothesis Testing [8 hours]. Unit 4: Probability concepts, including basic principles, conditional probability, independence, Testing the Difference Between Two Means, Two Proportions, and Two, Variances, Critically evaluate statistical information , Correlation and Regression [6 hours].							
Learning and Teaching Strategies								
 Strategies	• Presentations • Discussions • Tutorial and graphics • Problem solving • Brain storming • Research and reporting • Problem Solving • Report & discussion assessment							

Student Workload (SWL)			
Structured SWL (h/sem)	48	Structured SWL (h/w)	3.2
Unstructured SWL (h/sem)	27	Unstructured SWL (h/w)	1.8
Total SWL (h/sem)	75		

Delivery Plan (Weekly Syllabus)		
المناهج الاسبوعي النظري		
	Material Covered	LOs
Week 1-2	Understanding Basic Statistical Concepts Fundamentals (Introduction to Statistics) Presentation of Statistical Data	A2, B1, B2, C1
Week 3	Apply statistical methods	A2, B1, B2, C1
Week 4	Data Collection and Sampling, Interpret and communicate statistical results	A2, B1, B2, C1
Week 5-6	Understanding of probability concepts, including basic principles, conditional probability, independence	A2, B1, B2, C1
Week 7	Critical Thinking and Interpretation Discrete Probability Distributions	A2, B1, B2, C1
Week 8	Mid Term Exam	A2, B1, B2, C1
Week 9-10	Critically evaluate statistical information Continuous Distribution	A2, B1, B2, C1
Week 11	probability concepts, including basic principles, conditional probability, independence Hypothesis Testing	A2, B1, B2, C1
Week 12	Probability concepts, including basic principles, conditional probability, independence Testing the Difference Between Two Means, Two Proportions, and Two Variances	A2, B1, B2, C1
Week 13-14	Critically evaluate statistical information Correlation and Regression	A2, B1, B2, C1

Week 15	Preparation for the final exam	A2, B1, B2, C1
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Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	A2
	Assignments	2	10% (10)	2, 4,6,8,10,12 and 14	A2
	Classroom interaction	ALL	10% (10)	ALL	A2
	Presentation	1	10% (10)	13	A2,B1,B2
Summative assessment	Midterm Exam	1hr	10% (10)	7	A2
	Final Exam	3hr	50% (50)	15	A2
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	



Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	"Statistics for Business and Economics" by Paul Newbolt, William L. Carlson, and Betty Thorne: This book focuses on applying statistical methods to business and economics. It covers topics such as regression analysis, hypothesis testing, and time series analysis.	Yes
Recommended Texts	1. Stat Trek (stattrek.com): Stat Trek is an online statistics tutorial site. It offers a comprehensive set of lessons covering various statistical concepts, along with interactive calculators and quizzes. 2. UCLA Statistical Consulting Group (stats.idre.ucla.edu): UCLA's Statistical Consulting Group provides an extensive collection of resources, including tutorials, examples, and guides for statistical software like R, SAS, and SPSS. 3. Khan Academy Statistics (khanacademy.org/math/statistics-probability): Khan Academy's statistics section is a free online resource with video lessons and interactive exercises. It covers a wide range of topics, from basic probability to inferential statistics	No
Websites	https://eng.alayen.edu.iq//colleges/e/42	

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.

