	وزارة التعليم العالي والبحث العلمي **جامعة المستقبل** كلية العلوم قسم الكيمياء الحياتية	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information **معلومات المادة الدراسية**			
Module Title	**Biostatistics**		**Module Delivery**
Module Type	**Basic**		• ☒ **Theory** • ☒ **Lecture** • ☐ **Lab** • ☐ **Tutorial** • ☐ **Practical** • ☐ **Seminar**
Module Code	UOMU036354		
ECTS Credits	4		
SWL (hr/sem)			
Module Level	3	**Semester of Delivery**	1
Administering Department	Department of BioChemistry	**College**	كلية العلوم
Module Leader		**e-mail**	
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**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 Aims **أهداف المادة الدراسية**	• Provide a detailed understanding of the chemical structure and properties of nucleic acids (DNA and RNA). • Explore the molecular mechanisms underlying the biosynthesis, replication, and degradation of nucleic acids. • Understand the physical and chemical interactions that govern nucleic acid stability and function. • Develop foundational knowledge for future studies in molecular biology, genetics, and biotechnology.
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	By the end of this course, students will be able to: 1. Classify different types of biological and health data. 2. Calculate and interpret descriptive statistics (mean, median, mode, variance). 3. Apply probability rules and understand common distributions (normal, binomial). 4. Perform hypothesis testing and interpret p-values. 5. Use correlation and regression to assess relationships between variables. 6. Apply ANOVA in analyzing biological experiments. 7. Critically evaluate statistical results in biomedical literature.
Indicative Contents **المحتويات الإرشادية**	1. **Introduction to Nucleic Acids** 2. **Structure of Nucleotides and Nucleosides** 3. **Primary and Secondary Structures of DNA** 4. **Types and Structures of RNA** 5. **Base Pairing and Hydrogen Bonding** 6. **Chemical Synthesis of Nucleic Acids (Basics)** 7. **DNA/RNA Stability and Denaturation** 8. **DNA Supercoiling and Topology (Overview)** 9. **Common Chemical Modifications and Damage to Nucleic Acids** 10. **Basic Analytical Techniques (e.g., UV Absorption,**

	Electrophoresis)

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	• Lectures with illustrative examples and problems • Use of real datasets from biological research • Problem-solving sessions • Discussions on published research articles

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	4.2
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	37	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	2.4
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% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects	1	5%(5)	-	
	Report	1	10% (10)	11	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8,13	LO # 1-7
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
	Material Covered
Week 1	Introduction to biostatistics and types of data

Week 2	Descriptive statistics: mean, median, mode, range, variance
Week 3	Data presentation: tables, graphs, histograms
Week 4	Probability concepts and basic rules
Week 5	Probability distributions: binomial and normal
Week 6	Sampling methods and sample size
Week 7	Confidence intervals and margin of error
Week 8	Hypothesis testing: null and alternative hypotheses
Week 9	t-test: one-sample, independent, and paired samples
Week 10	Chi-square test for categorical data
Week 11	Correlation analysis (Pearson & Spearman)
Week 12	Simple linear regression
Week 13	One-way ANOVA
Week 14	Interpreting statistical results in health and biology
Week 15	Final exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. **Basic Biostatistics: Statistics for Public Health Practice** – B. Burt Gerstman 2. **Biostatistics: A Foundation for Analysis in the Health Sciences** – Wayne W. Daniel 3. **Primer of Biostatistics** – Stanton A. Glantz	yes
Recommended Texts	• Online biostatistics tutorials and simulations • Research articles for applied statistics • Instructor-prepared notes and problem sets	
Websites	https://en.wikipedia.org/wiki/Biostatistics	

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 is 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.