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

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Analytical Techniques			**Module Delivery**	
Module Type	Basic			☒**Theory** ☐**Lecture** ☒**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	UOMU036233				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	2		**Semester of Delivery**	1	
Administering Department	Dept. of Biochemistry		**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**Version Number**		

RelationwithOtherModules

العلاقة مع المواد الدراسية الأخر ى			
Prerequisite module	**none**	**Semester**	
Co-requisites module	**none**	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادي ة	
Module Aims أهداف المادة الدراسية	This course aims to provide an understanding of the various analytical techniques used in biochemistry to analyze biological samples, understand molecular structures, and quantify biomolecules. It covers both classical and modern methods, emphasizing their applications, principles, and limitations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Understand the principles and applications of various analytical techniques in biochemistry. - Develop the ability to choose appropriate analytical methods for specific biochemical problems. - Gain practical experience in performing and interpreting the results of biochemical analyses.
Indicative Contents المحتويات الإرشادية	Introduction to Analytical Techniques in Biochemistry (4 hours) Centrifugation Techniques (2 hours) Spectroscopy Techniques (10 hours)

	Chromatography Techniques (8 hours) Electrophoresis Techniques (8 hours) work lab:(14 hours)

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	provides a comprehensive introduction to the key analytical techniques used in biochemistry.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	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	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظر ي

	Material Covered
Week 1	Overview of analytical methods in biochemistry
Week 2	importance of analytical techniques in research and diagnostics
Week 3	Safety and ethical considerations in biochemical analysis
Week 4	UV-Visible Spectroscopy Principles and instrumentation
Week 5	Applications in protein and nucleic acid quantification
Week 6	principles of fluorescence Applications in studying protein folding, enzyme kinetics
Week 7	principles and instrumentation Applications in biomolecular structure determination
Week 8	:Nuclear Magnetic Resonance (NMR) Spectroscopy Basic principles of NMR Applications in structure elucidation of small molecules and proteins
Week 9	Thin-Layer Chromatography (TLC) Basic principles and techniques Applications in separation of biomolecules
Week 10	Gas Chromatography (GC) Principles and instrumentation Applications in metabolite analysis
Week 11	:High-Performance Liquid Chromatography (HPLC) Principles and types (e.g., reverse-phase, ion-exchange) Applications in protein and peptide analysis
Week 12	affinity Chromatography Principles and use in protein purification
Week 13	electrophoresis Techniques Gel Electrophoresis Principles of agarose and polyacrylamide gel electrophoresis Applications in DNA, RNA, and protein analysis
Week 14	capillary Electrophoresis Principles and applications in nucleic acid and small molecule analysis
Week 15	Final Exam.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered

Week 1-2	spectrophotometer Parts & principle setting up & Calibration Uses and care
Week 3-4	Centrifugation. Parts & principle of the centrifuge Types & Applications Care and safety
Week 5-6	Electrophoresis. electrophoresis apparatus Principle & Uses Care and safety
Week 7-8	filtration apparatus Types & Uses of the filters
Week 9-10	Paper chromatography techniques
Week 11-12	Thin layer chromatography techniques
Week 13	Review

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Principles and Techniques of Biochemistry and Molecular Biology" by Keith Wilson and John Walker	Yes
Recommended Texts	Analytical Biochemistry" by David J. Holme and Hazel Peck	No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجا ت				
Group	**Grade**	التقدي ر	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتيا ز	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	مقبول بقرا ر	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB 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.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة يف وزارة التعليم العا يل والبحث العل ي م