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	**Lipid Chemistry II**			**Module Delivery**	
Module Type	Basic			☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	Uomu036362				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	3		**Semester of Delivery**	2	
Administering Department	Biochemistry department		**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 Date			**Version Number**	1.0	

RelationwithOtherModules 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	• Deepen students' understanding of complex lipid metabolism and regulation. • Explore the biochemical mechanisms underlying lipid-related diseases. • Study the structural and signaling roles of lipids in membranes and cellular pathways. • Introduce advanced analytical methods for lipid profiling and functional analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of this course, students will be able to: 1. Describe pathways of lipid metabolism including synthesis and degradation. 2. Explain the function and classification of lipoproteins. 3. Analyze the role of lipids in metabolic diseases. 4. Perform advanced laboratory techniques for lipoprotein and lipid profile analysis. 5. Interpret lipid profile results in clinical context. 6. Understand the pharmacological approaches to manage lipid disorders.
Indicative Contents المحتويات الإرشادية	By the end of this course, students should be able to: 1. **Advanced Fatty Acid Metabolism**, β-oxidation regulation, ω-oxidation, disorders of fatty acid metabolism 2. **Ketone Bodies and Ketogenesis**, Synthesis, utilization, clinical significance 3. **Complex Lipid Metabolism**, Glycerophospholipids, sphingolipids, and their synthesis/degradation 4. **Lipoprotein Metabolism**, Chylomicrons, VLDL, LDL, HDL, reverse cholesterol transport 5. **Steroid Biosynthesis and Regulation**, Cholesterol-derived hormones: corticosteroids, androgens, estrogens 6. **Lipid Signaling Pathways**, Phosphoinositides, DAG, ceramides, eicosanoids 7. **Eicosanoids and Related Compounds**, Prostaglandins, leukotrienes, thromboxanes 8. **Membrane Lipid Organization**, Lipid rafts, bilayer dynamics, fluidity 9. **Lipidomics and Analytical Techniques**, Chromatography, mass spectrometry, TLC 10. **Lipid-Associated Diseases**. Atherosclerosis, obesity, NAFLD, lipid storage diseases

	Nutritional and Pharmacological Aspects of Lipids .Dietary lipids, statins, PUFA roles
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• . Lectures supported by visual and interactive media • Laboratory practical sessions • Case-based learning and clinical discussions • Group assignments and mini-presentations

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	65	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	85	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.6
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	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	3hr	50% (50)	15	All

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظر ي	
	Material Covered
Week 1	Overview of Lipid Metabolism
Week 2	Fatty Acid Biosynthesis and Oxidation
Week 3	Ketone Bodies Metabolism
Week 4	Lipoproteins: Structure and Function
Week 5	Cholesterol Metabolism and Regulation
Week 6	Triglyceride Metabolism
Week 7	Hormonal Regulation of Lipid Metabolism
Week 8	Lipid Transport and Storage
Week 9	Lipid-related Metabolic Disorders
Week 10	Role of Lipids in Diabetes and Obesity
Week 11	Pharmacology of Lipid-lowering Agents
Week 12	Laboratory Quality Control in Lipid Analysis
Week 13	Practical Exam
Week 14	Theoretical Review
Week 15	Final Written Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1 -2	Lab safety refresher and lipid metabolism outline
Week 2 -4	Assay of fatty acid synthesis enzymes
Week 3	Detection of ketone bodies in biological samples

Week 4	Separation and quantification of lipoproteins
Week 5	Cholesterol esterification assay
Week 6	Measurement of triglycerides in serum
Week 7	Effects of insulin and glucagon on lipid assays
Week 8	Lipoprotein electrophoresis
Week9	Case studies: Hyperlipidemia and atherosclerosis
Week 10	Comparative analysis of lipid profiles in patients
Week 11	Evaluation of drug effects on lipid metabolism
Week 12	Calibration and validation of lipid assays

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. *Lehninger Principles of Biochemistry* – Nelson & Cox 2. *Biochemistry* – Garrett & Grisham 3. *Lipid Metabolism and Disease* – Edited by Robert H. Glew	*Clinical Chemistry*
Recommended Texts	• Departmental laboratory manuals • Recent research articles on lipid metabolism and diseases • Instructor-prepared lecture notes and slides	*Fundamentals of Clinical Chemistry*
Websites	https://www.britannica.com/science/lipid	

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