المـــــــركز الوطـــــــني لضمـــــان جـــــودة واعتمـــــاد
المـــــؤسسات التعليميـــــة و التـــــدريبية

المتطلبات الأكاديمية للمقرر الدراسي

اسم المؤسسة التعليمية: Dorob al itussm Institute for Medical Sciences

اسم البرنامج التعليمي: Pharmacy

اسم المقرر: Biochemistry

رمز المقرر: PTD 233

الفصل/العام الدراسي: 2025

المتطلبات الأكاديمية للمقرر الدراسي

1. معلومات عامـــــــــــة:

1	اسم المقرر الدراسي	Biochemistry
2	رمز المقرر	PTD 233
3	منسق المقرر	
4	القسم / الشعبة التي تقدم البرنامج	Pharmacy
5	الأقسام العلمية ذات العلاقة بالبرنامج	-
6	الساعات/الوحدات الدراسية للمقرر	2/2/week
7	اللغة المستخدمة في العملية التعليمية	English
8	السنة الدراسية/ الفصل الدراسي	First Semester
9	تاريخ وجهة اعتماد المقرر	DD/MM/YYYY

1.1 عدد الساعات الأسبوعية:

محاضرات 2 معامل تدريب 2 المجموع 4

2.1 نوع المقرر

عام		تخصصي	✓	اختياري		داعم	

2-أهـــــداف المقرر:Course objectives

Upon completion of this course, students will be able to:

1- Understand the structure, function, and metabolism of biomolecules (carbohydrates, lipids, proteins, nucleic acids).

2- Explain fundamental metabolic pathways and their regulation in the human body

3- Integrate biochemical knowledge with physiological and pathological conditions.

4- Apply biochemical principles to pharmaceutical and clinical contexts.

5- Develop practical laboratory skills relevant to biochemical analysis

3. Intended Learning Outcomes (ILOs)

A. Knowledge and Understanding

Code	Outcome

Code	Outcome
A.1	Define key biochemical terms and concepts.
A.2	Describe the structure, properties, and biological roles of major biomolecules.
A.3	Outline the major catabolic and anabolic pathways and their interrelationships.
A.4	Explain the mechanisms of enzyme action, kinetics, and regulation.
A.5	Relate biochemical processes to organ function and homeostasis.

B. Mental Skills

Code	Outcome
B.1	Correlate molecular structure with biochemical function.
B.2	Predict metabolic outcomes given specific substrates, enzymes, or regulatory signals.
B.3	Analyze clinical case studies to identify underlying biochemical disorders.
B.4	Differentiate between normal biochemical processes and dysfunctions in disease states.
B.5	Interpret data from biochemical experiments.

B. Mental Skills

Code	Outcome
B.1	Correlate molecular structure with biochemical function.
B.2	Predict metabolic outcomes given specific substrates, enzymes, or regulatory signals.
B.3	Analyze clinical case studies to identify underlying biochemical disorders.
B.4	Differentiate between normal biochemical processes and dysfunctions in disease

Code	Outcome
	states.
B.5	Interpret data from biochemical experiments

C. Practical and Professional Skills

Code	Outcome
C.1	Safely and accurately perform fundamental biochemical laboratory techniques.
C.2	Prepare reagents, standard solutions, and buffers.
C.3	Conduct qualitative and quantitative analysis of biomolecules.
C.4	Operate basic laboratory instruments (e.g., spectrophotometer, pH meter).
C.5	Record, analyze, and present experimental data professionally.

D. General and Transferable Skills

Code	Outcome
D.1	Collaborate effectively in team-based laboratory work.
D.2	Communicate biochemical concepts clearly in written and oral forms.
D.3	Utilize scientific literature and resources for self-directed learning.
D.4	Apply problem-solving skills to biochemical scenarios.
D.5	Manage time effectively to meet academic and practical deadlines.

4. Course Contents

Week	Theory Topics	Practical / Lab Work	Hours (T+P)
Week 1	Introduction to Biochemistry: Water, pH, Buffers	Lab Safety, Introduction to Equipment, Buffer Prep	2+2
Week 2	Amino Acids & Proteins: Structure & Function	Qualitative Tests for Amino Acids & Proteins	2+2
Weeks 3-4	Protein Structure; Enzymes: Mechanism & Kinetics	Protein Purification / Spectroscopy; Enzyme Assays	4+4
Weeks 5-6	Carbohydrates: Structure & Metabolism (Glycolysis, TCA)	Qualitative & Quantitative Carbohydrate Tests	4+4
Week 7	Lipids: Structure & Metabolism (Beta-oxidation)	Analysis of Fats & Oils; Saponification Number	2+2
Week 8	**Midterm Exam (Theory + Practical)**		-
Week 9	Nucleic Acids: DNA/RNA Structure, Replication, Transcription	DNA Isolation from Biological Samples	2+2
Weeks 10-11	Metabolism Integration & Regulation; Bioenergetics	Metabolic Pathway Analysis (Case Studies)	4+4
Weeks 12-13	Clinical Biochemistry, Vitamins, Hormones	Analysis of Simulated Clinical Samples	4+4
Week 14	Final Project Discussions & Review	Work on Final Project / Data Analysis	2+2
Week 15	Revision & Problem-Solving	Lab Revision & Practical Exam Preparation	2+2

Week	Theory Topics	Practical / Lab Work	Hours (T+P)
Week 16	**Final Examinations**		-
Total Hours			**32 + 32**

5. Teaching and Learning Methods

Lectures: Interactive presentations to deliver core theoretical concepts.
Laboratory Sessions: Hands-on experiments to reinforce theoretical knowledge and develop technical skills.
Tutorials & Group Discussions: For problem-solving, case study analysis, and clarification of complex topics.
Assignments & Quizzes: Regular assessments to encourage continuous learning.
Final Project: A comprehensive project requiring integration of knowledge and practical skills.
E-Learning Resources: Use of online platforms for sharing materials, announcements, and supplementary resources.

6. Assessment Methods

Assessment Method	Date of Assessment	Weight
Quizzes & Class Participation	Throughout Semester	10%
Practical Assignments & Lab Work	Throughout Semester	30%
Midterm Exam (Theory + Practical)	Mid-Semester	20%
Final Project	End of Semester	20%
Final Exam (Theory + Practical)	End of Semester	20%
Total		**100%**

7. References and Periodicals

Title	Author	Publisher	Edition
Lehninger Principles of Biochemistry	Nelson, D.L., & Cox, M.M.	W.H. Freeman	7th edition
Biochemistry (Lippincott's llustrated Reviews Series)	Champe, P.C., Harvey, R.A., Ferrier, D.R.	Lippincott Williams & Wilkins	8th edition

8- Facilities and Resources Required

Lecture Halls: Equipped with projector, screen, and audio system

Biochemistry Laboratory: Equipped with basic instruments (spectrophotometers, centrifuges, water baths, pH meters, gel electrophoresis units)

Virtual Learning Environment (VLE): A platform (e.g., Moodle) for sharing course materials, assignments, and communication.

منسق المقرر..... التوقيع .....

منسق البرنامج..... التوقيع .....

التاريخ...../...../.....م

مصفوفة المقرر الدراسي الكيمياء الحيوية (Biochemistry)

الأسبوع الدراسي	المعرفة والفهم					المهـــارات														
						(1) المهارات الذهنية					(2) المهارات العلمية والمهنية					(ج) المهارات العامة				
	أ.1	أ.2	أ.3	أ.4	أ.5	ب.1	ب.2	ب.3	ب.4	ب.5	ج.1	ج.2	ج.3	ج.4	ج.5	د.1	د.2	د.3	د.4	د.5
1	√					√					√									
2	√					√					√					√				
3		√					√					√				√				
4		√					√					√				√				
5			√				√						√			√				
6			√				√					√				√				
7			√					√					√				√			
8	Midterm Exam																			
9			√					√						√			√			
10			√					√						√			√			
11			√	√			√						√					√		
12				√				√						√				√		
13				√					√					√				√		
14					√					√					√				√	
15					√					√					√					√
16	Final Exam																			