CIHAN UNIVERSITY-SULAIMANIYA

Course Outline

2023-2024

Address:
Chwarchra-Opposite to Family Mall
Sulaymaniyah City
Kurdistan Region–Iraq
Tel: 07714695656,
email: presidency@sulicihan.edu.krd

MODULE DESCRIPTION FORM

Module Information					
Module Title	**Biochemistry**				
Module Type	Theory &practical			☐Theory ☐ Lecture ☐Lab ☐Tutorial ☐Practical ☐Seminar ☐Report ☐ Extra activity	
Module Code					
Language	English				
ECTS Credits	**7**				
Module Level			**Semester of Delivery**	**1st**	
Administering Department	**MLA**		**College**	**Health Sciences**	
Lecturer	**Anvar Soleimani, Darya Shorsh**				
Academic Title	**Lecturer**		**Qualification**		
Module Tutor			**e-mail**	Anvar.solaimani@sulicihan.edu.krd Darya.shorsh@sulicihan.edu.krd	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**		
Cycle of Study	Bachelor		**Form of Education**	Full time	

Relation with other Modules			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Cihan University-Sulaimaniya?

College of

Department:
ANS
Discipline:
Stage: 2

Total Contact Hours:	**56**
Total Self Study Hours:	**133**
Total No. Hours:	**189**
ECTS:	**7**

No. of Weeks	Contact Hours					Self-Study					
	Theoretical	Practical	Lab	Project	Visit	Quiz	Reading	Assignment	Lab Report	Midterm Exam.	Final Exam.
1st Week (Introduction)	2		1								
2nd Week	2	1	1				4	2		15	30
3rd Week	2	1	1			2	4		2		
4th Week	2	1	1				4				
5th Week	2	1	1	1		2	4		2		
6th Week	2	1	1				4	3			
7th Week		1	1								
8th Week	2	1	1				4				
9th Week	2	1	1			2	4	3	2		
10th Week	2	1	1	1			4				
11th Week	2	1	1				4		2		
12th Week	2	1	1	1			4				
13th Week	2	1	1				4		2		
14th Week	2	1	1				4				
15th Week (Pr. Final Ex										20	
16th Week (Final Exam.)											
TOTAL	**26**	**13**	**14**	**3**			**48**	**8**	**10**	**35**	**30**

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to Biochemistry
Week 2	Carbohydrates Part I: Classification of carbohydrates. definition, function, and examples of monosaccharides, disaccharides, and polysaccharides. GAGs, and examples of GAGs.
Week 3	Carbohydrate part II: Digestion and Absorption of Carbohydrates. Carbohydrate metabolism disorders including types of diabetes mellitus
Week 4	Amino acids and Peptides: types and structure of amino acids, essential and nonessential amino acids, biological importance of amino acids and peptides.
Week 5	Proteins: structure of a protein from amino acid sequence to quaternary structure of proteins. Types of proteins and their function.
Week 6	Enzymes: definition of enzyme and their Classification. How enzymes catalyze biological reactions, Factors affecting enzyme activities.
Week 7	**Midterm theoretical Exam**
Week 8	Lipids: types of lipids and their classification. Function of lipids. Fatty acid structure and essential fatty acids. Differences between oil and fat and saturated fatty acids with unsaturated fatty acids. Phospholipids and types of phospholipids.
Week 9	Nucleic Acids: Structure of Nucleic acids including DNA and RNA. Structure of Nucleotides. Differences between RNA and DNA
Week 10	Glucose Metabolism: Glycolysis, Aerobic and anaerobic respiration, Gluconeogenesis. TCA cycle, Electron Transport Chain
Week 11	Acid-base Balance: pH definition, Physiological Buffer systems, acid-base disorders
Week 12	Electrolytes: Cations and Anions, Physiological role of Electrolytes, Anion GAP
Week 13	Vitamins: Water and lipid soluble vitamins. Structure and function of vitamins plus their toxicities and RDA
Week 14	Nonprotein nitrogenous compounds: metabolism and clinical value of Creatine, Urea, and Uric acid
Week 15	**Final Practical Exam**
Week 16	**Final Theoretical Exam**

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	First Week Lab-Introduction and Safety
Week 2	Identification of Carbohydrates-Molisch test, Iodine test
Week 3	Identification of Carbohydrates- benedicts and Fehling's tests
Week 4	Barford's test
Week 5	Identification of unknown carbohydrates
Week 6	Introduction to lipids solubility/ Acrolein test
Week 7	Saponification
Week8	Identify the steroids by specific chemical test
Week9	Identification of Amino acids- Ninhydrin Test
Week 10	Introduction to protein/ color reaction of proteins
Week 11	Thin layer chromatography
Week 12	Precipitation of proteins/solubility
Week 13	Hydrolysis of sucrose and starch/ fermentation/ phenyl hydrazine reaction
Week 14	Measurement of glucose by Digital Glucometer
Week 15	**Review**
Week 16	**Final Exam**

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	The biochemistry module aims to provide a comprehensive understanding of the molecular foundations of biological processes. This module aims to equip students with knowledge about the structure and function of macromolecules, including proteins, nucleic acids, carbohydrates, and lipids, and their roles in cellular metabolism. By studying the biochemical pathways and the regulation of metabolic processes, students will learn how various biochemical reactions contribute to homeostasis and the maintenance of life. This foundational knowledge is critical for future applications in clinical diagnostics, as it will enable students to interpret biochemical data and understand the underlying mechanisms of diseases. Furthermore, the module is designed to develop practical skills in biochemical laboratory techniques, including qualitative and quantitative tests. Students will engage in hands-on experiments to analyze biochemical substances relevant to clinical settings, fostering an understanding of the

	application of biochemistry in diagnosing and monitoring health conditions. By integrating theoretical knowledge with practical experience, the module aims to prepare students for careers in medical laboratory sciences, emphasizing the importance of biochemistry in the interpretation of laboratory results and the development of innovative healthcare solutions.
Module Learning Outcomes	To understand basic chemical properties of molecules that make life possible, and how these properties relate to specific macromolecular structures and functions. Proteins, carbohydrates, nucleic acids, lipids and biological membranes will be understood. The mode of action of enzymes and macromolecular complexes as protein machines will be investigated. An introduction to biochemical and biophysical methods will be given. The functions of mitochondria in oxidative phosphorylation and photosynthesis respectively will be discussed, as well as how energy can be released during catabolism and how it can be stored during anabolism.

Learning and Teaching Strategies	
Strategies	Theoretical: power point presentation, discussion, videos and white board writing. Practical: practical work in the lab., power point presentation, white board writing.

Module Evaluation

Assessment Types		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Attendance (Th & Pr)**	4	4%		
	Assignments (Th)	2	2%		
	Activity (Th)	2	2%		
	Lab. Report (Pr)	8	8%		
	Quizzes (Th & Pr)	8	8%		
	Lab. rep. Presentation	4	4%		
	Lab. Attitude (Pr)	2	2%		
Summative assessment	**Midterm Exam (Th)**	2hr	20%	7th	
	Final Pr. Exam	2hr	20%	15th	
	Final Exam (Th)	3hr	30%	16th	
Total assessment			100% (100 Marks)		

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Lippincott, Essential of Biochemistry,	
Recommended Texts	Lehninger Principles of Biochemistry Harper's Illustrated Biochemistry	
Websites		

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.

- **Cycle of studies - choose one of the three options: Bachelor «1», Master «2», PhD. «3»**
- **(Exam: Oral Examination, Written Exam), and (Continous Evaluation(CE), Portfolio).**
- **Discipline status (Content) - for the Bachelor level, choose one of the options: FD (Fundamental (General) Discipline), PF (Preparatory Disciplines in the Field), SD (Specialty Disciplines), CD (Complementary Disciplines), DU (Disciplines based on the University's options).**
- **Discipline status (compulsoriness) - choose one of the options**
  a. MD (Mandatory discipline)
  b. OD (Optional Discipline)
  c. ED (Elective (Facultative) Discipline).

Approved by Head of the Branch / Department

Signature	
Date	
Name	

Approved by Curriculum Development Committee and Bologna Process Committee	
Signature	
Date	
Name	