Republic of Yemen

Ministry of Higher Education & Scientific Research

Council of Academic Accreditation & Quality Assurance of Higher Education (CAQA)

21 September University of Medical and applied Sciences

Faculty of Medical Applied Science

Course Specification of

Biochemistry

Course Code. ()

2024

T4: This Template is Developed and Approved by CAQA-Yemen, 2023

Prepared by:	Reviewed by:	Head of the Department:	Quality Unit:	Dean
Dr. Abdulelah Thabet	Dr: Ali yahawe	Dr : Fares Mahdi	Dr:Houri AlSabri .	Dr: Abdulhameed Al-Dhifani

Template for Course Specification

I. Course Identification and General Information:

1	**Course Title:**	**Biochemistry**			
2	**Course Code & Number:**	()			
3	**Credit Hours:**	**Credit Hours**	**Theory Hours**		**Lab. Hours**
			Lecture	**Field**	
		2	2	--	--
4	**Study Level/ Semester at which this Course is offered:**	Level1\term1			
5	**Pre –Requisite (if any):**	None			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Bachelor of Anesthesia Technician			
8	**Language of Teaching the Course:**	English			
9	**Study System:**	Semester Based System			
10	**Mode of Delivery:**	Full Time			
11	**Location of Teaching the Course:**	**Faculty of Medical Applied Science**			
12	**Prepared by:**	Abdallah Thabt			
13	**Date of Approval:**	**2024**			

II. Course Description:

The course is designed to assist the students to acquire knowledge of the normal biochemical composition and functioning of human body and alterations in understand the biochemistry in diseases for practice of emergency medicine. This course aims to provide students with basic knowledge about

structures, classifications of carbohydrates, lipids, proteins, vitamins, enzymes and hormones. In addition to the regulatory mechanisms of metabolic pathway.

III. Course Intended Learning Outcomes (CILOs) : (مخرجات تعلم المقرر)		Referenced PILOs (مخرجات تعلم البرنامج)	
A. Knowledge and Understanding: Upon successful completion of the course, students will be able to:			
a1	Identify the structure, function and metabolic pathways of carbohydrates, lipids, fatty acids and lipoproteins, nucleotides and their micro-molecules, regulatory mechanisms and their function.	**A1**	Describe normal and abnormal human behaviors, structure and function of human body and identify the basics of intensive care, medical emergencies that the anesthetist and high dependency care units and how to manage patients at risk
a2	Demonstrate the disorders in metabolic pathways of proteins, amino acids, enzymes, vitamins, minerals, nucleic acids in humans as well as the mechanism of hormones action on the metabolic pathways regulation.	**A2**	Demonstrate the concepts and principles of anesthesia and different basic and humanities courses and its applications in anesthesia practice
B. Intellectual Skills: Upon successful completion of the course, students will be able to:			
b1	Compare between the types, structure and metabolism of carbohydrates, lipids, fatty acids, lipoprotein and vitamins with signs, symptoms, biochemical laboratory finding of some metabolic disorders	**B1**	Interpret the basic normal anatomical structures on radiographs, C.T. scans and magnetic resonance images and readings of the standard monitors attached to the patient as well as additional monitors as central venous pressure monitoring.
b2	Differentiates between normal and abnormal biochemical parameters investigations of proteins, amino acids, enzymes, vitamins, minerals and nucleic acids.	**B4**	Demonstrate competence in the use of language, libraries, and databases and in basic concepts of research methodology and epidemiology and be able to critically analyze

			relevant published research literature.
C. Professional and Practical Skills: Upon successful completion of the course, students will be able to:			
c1	Apply colorimetric analysis principles in estimation of blood glucose, serum proteins, albumin, lipoprotein, cholesterol, uric acid, urea and creatinine	**C1**	Apply the skills necessary for maintaining a patent airway, manual ventilation, intubation and mechanical ventilation. and Perform the proper technique of anesthesia (general, regional or local anesthesia)
c2	Identify laboratory reagents and instruments used in biochemistry laboratory	**C2**	Perform an approach to the assessment of risk and need for consultation for an anesthetics, identify appropriate laboratory investigations, pre-medications and fasting guidelines and Set up anesthesia machine and its connections and demonstrate appropriate application and interpretation of commonly used monitors in anesthesia preoperatively
D. Transferable Skills: Upon successful completion of the course, students will be able to:			
d1	Apply the principles of communication with patient and families using appropriate verbal and nonverbal methods during investigation.	D1	. Communicate effectively with individuals and groups and members of the health team in order to promote effective interpersonal relationships and teamwork
d2	Utilize the principles of ethics during routine investigations.	D2	. Demonstrate professional, ethical, moral, legal, and spiritual concepts into one's practice within a global environment

(A) Alignment of Course Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	**Teaching Strategies**	**Assessment Strategies**
a1	Identify the structure, function and metabolic pathways of	▪ Interactive lecture ▪ Seminars and student	▪ Assignments ▪ Quizzes

	carbohydrates, lipids, fatty acids and lipoproteins, nucleotides and their micro-molecules, regulatory mechanisms and their function.	presentations ▪ Brain storming, role-play and simulation ▪ Small group for discussing	▪ Mid-term Exam ▪ Final exam ▪ Presentations
a2	Demonstrate the disorders in metabolic pathways of proteins, amino acids, enzymes, vitamins, minerals, nucleic acids in humans as well as the mechanism of hormones action on the metabolic pathways regulation.	▪ Interactive lecture ▪ Seminars and student presentations ▪ Brain storming, role-play and simulation ▪ Small group for discussing	▪ Assignments ▪ Quizzes ▪ Mid-term Exam ▪ Final exam ▪ Presentations

(B) Alignment of Course Intended Learning Outcomes (Intellectual Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
b1	Compare between the types, structure and metabolism of carbohydrates, lipids, fatty acids, lipoprotein and vitamins with signs, symptoms, biochemical laboratory finding of some metabolic disorders	▪ Interactive lecture ▪ Brain storming ▪ Role-play & simulation ▪ Small group discussions ▪ Seminars and student presentations	▪ Assignments ▪ Quizzes ▪ Mid-term Exam ▪ Final exam
b2	Differentiates between normal and abnormal biochemical parameters investigations of proteins, amino acids, enzymes, vitamins, minerals and nucleic acids.	▪ Interactive lecture ▪ Brain storming ▪ Role-play & simulation ▪ Small group discussions ▪ Seminars and student presentations	▪ Assignments ▪ Quizzes ▪ Mid-term Exam ▪ Final exam

(C) Alignment of Course Intended Learning Outcomes (Professional and Practical Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
c1	Apply colorimetric analysis principles in estimation of blood glucose, serum proteins, albumin, lipoprotein, cholesterol, uric acid, urea and creatinine	▪ Case-Based Learning ▪ Clinical teaching & learning ▪ Laboratory work ▪ Role plays & simulation ▪ Small group discussion	▪ Assignments ▪ Practical/Clinical examination ▪ Reports (Lab Reports.) ▪ Lab work ▪ Assessment of skills

		▪ Seminar (Discussions) ▪ Practice session ▪ Problems solving	with checklist
c2	Identify laboratory reagents and instruments used in biochemistry laboratory	▪ Case-Based Learning ▪ Clinical teaching & learning ▪ Laboratory work ▪ Role plays & simulation ▪ Small group discussion ▪ Seminar (Discussions) ▪ Practice session ▪ Problems solving	▪ Assignments ▪ Practical/Clinical examination ▪ Reports (Lab Reports.) ▪ Lab work ▪ Assessment of skills with checklist

(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:

Course Intended Learning Outcomes		Teaching Strategies	Assessment Strategies
d1	Apply the principles of communication with patient and families using appropriate verbal and nonverbal methods during investigation.	▪ Group work ▪ Case Study ▪ Role play	▪ Presentations ▪ Case Studies ▪ Learning activities
d2	Utilize the principles of ethics during routine investigations.	▪ Classroom discussions, ▪ Problems solving ▪ Case study analysis	▪ Presentations ▪ Case Studies ▪ Learning activities

IV. Course Contents:

A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	Introduction to biochemistry	▪ Introduction ▪ Definition ▪ Normal biochemical processes ▪ Impact of the Human Genome Project (HGP) on Biochemistry & Medicine	**1**	**2**	a1, b1, c1, d1

		▪ Uses of biochemical investigations and laboratory tests in relation to diseases			
2	Carbohydrates & carbohydrate metabolism	▪ Definition ▪ Properties, structure, composition, and function ▪ Classification of carbohydrates o Monosaccharide (derivatives and importance o Disaccharides (Structure, glycosides bonds and importance) o Polysaccharides(Homo- and heterorogenoous and their importance) ▪ Introduction to Metabolism ▪ Blood glucose regulation ▪ Glycolysis and Kreb's cycle ▪ Glycogen metabolism ▪ Metabolic disorders	**2**	**4**	a1, b1, c1, d1
3	Lipids	▪ Definition ▪ Properties, structure, composition and functions ▪ Classification of lipids	**2**	**4**	a1, b1, d1
4	Fatty acids	▪ Properties of Fatty acid ▪ Eicosanoids ▪ Metabolism of fatty acid ▪ Metabolic disorders	**1**	**2**	a1, b1, d1
5	Lipoprotein & Cholesterol	▪ Properties ▪ Functions ▪ Atherosclerosis ▪ Investigations and their interpretations	**1**	**2**	a1, b1, c1, d1
6	Midterm exam	Midterm exam	**1**	**2**	a1, b1, c1, d1
7	Proteins	▪ Properties, structure, composition , and importance ▪ classification of proteins	**2**	**4**	a2, b2, c2, d2
8	Amino acids	▪ Properties & importance of amino acids ▪ Classification and structure of amino acids ▪ Amino acid metabolism	**1**	**2**	a2, b2, c2, d2

		(Transamination - Deamination – Urea formation)			
9	Enzymes	▪ Definition ▪ Properties of enzymes ▪ Mechanism of enzyme action ▪ Classification ▪ Biological importance of enzymes ▪ Factors effecting activity of enzymes	**1**	**2**	a2, b2, c2, d2
	Vitamins and minerals	▪ Definition ▪ Classification ▪ Deficiency ▪ Absorption ▪ Storage ▪ Normal concentration Investigations and their interpretations	**1**	**2**	a2, b2, c2, d2
	Nucleic acids	▪ Properties ▪ Importance ▪ Types ▪ Structure & chemical composition ▪ Nucleic acid metabolism	**2**	**4**	a2, b2, c2, d2
	Final exam	**Final exam**	**1**	**2**	a2, b2, c2, d2
Number of Weeks /and Units Per Semester			**16**	**32**	

B. Case Studies and Practical Aspect:

No.	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	None			
Number of Weeks /and Units Per Semester				

C. Tutorial Aspect:

No.	Tutorial	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	None			

Number of Weeks /and Units Per Semester			

V. Teaching Strategies of the Course:

1. Interactive lecture
2. Seminars and student presentations
3. Brain storming
4. Role-play and simulation
5. Small group discussion
6. Learning tasks and activities
7. Problems solving
8. Case study analysis

VI. Assessment Methods of the Course:

- Assignments
- Quizzes
- Mid-term exam
- Final term exam

VII. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
1	**Assignment 1:** Glycolysis and Kreb's cycle	W5	**5**	a1, b1
2	**Assignment 2:** Amino acid metabolism (Transamination - Deamination – Urea formation)	W12	5	a2, b2,
Total			**10**	

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	**Assignments**	W5,11	10	10%	a1, b1, a2, b2
2	**Quizzes 1 & 2**	W3, 9	10	10%	a1, a2
3	**Mid-Term Theoretical Exam**	W7	20	20%	a1, b1, c1, d1
4	**Final Theoretical Exam**	W16	60	60%	a2, b2, c2, d2
Total			**100**	**100%**	

IX. Learning Resources:

- *Written in the following order:* Author, Year of publication, **Title**, Edition, Place of publication, Publisher.

1- Required Textbook(s) (maximum two): مثال example

1. Ochs R., (2021).Biochemistry, 2nd Ed., India
2. Halkerston ID (2007). The national medical series for independent study: biochemistry. 2nded. Pennsylvania, Harwal Publishing Co.

2- Essential References:

1. Meisenberg G., & Simmons W., (2017). Principles of medical biochemistry. 4th Ed., China
2. David W, Peter A, Victor W(2001). Haper's review of biochemistry. 19th ed. Middle East Ed, Librairie du Liban.

3- Electronic Materials and Web Sites etc.:

Websites:

1. www.ANA.com
   - www.ASCO.com

X. Course Policies: (Based on the Uniform Students' By law (2007) تترك كما هي

1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** A student will be considered late if he/she is not in class after 10 minutes of the start time of class.

3	**Exam Attendance/Punctuality:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
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Dr. Abdulelah Thabet	Dr: Ali yahawe	Dr : Fares Mahdi	Dr:Houri AlSabri .	Dr: Abdulhameed Al-Dhifani

Template for Course Plan (Syllabus)

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member:	Abdallah thabt						
Location& Telephone No.:	**776936605**						
E-mail:		SAT	SUN	MON	TUE	WED	THU
Office Hours							

I. Course Identification and General Information:					
١	**Course Title:**	**Biochemistry**			
2	**Course Code & Number:**	()			
3	**Credit Hours:**	**Credit Hours**	**Theory Hours**		**Lab. Hours**
			Lecture	**Field**	
		2	2	--	--
4	**Study Level/ Semester at which this Course is offered:**	Level 1\term1			
5	**Pre –Requisite (if any):**	None			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Bachelor of Anesthesia Technician			
٨	**Language of Teaching the Course:**	English			

Prepared by:	Reviewed by:	Head of the Department:	Quality Unit:	Dean
Dr. Abdulelah Thabet	Dr: Ali yahawe	Dr : Fares Mahdi	Dr:Houri AlSabri .	Dr: Abdulhameed Al-Dhifani

٩	**Study System:**	Semester Based System
١٠	**Mode of Delivery:**	Full Time
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		▪ Blood glucose regulation ▪ Glycolysis and Kreb's cycle ▪ Glycogen metabolism ▪ Metabolic disorders			
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