Specification for Biochemistry Course (B)
2025/2026

1) Basic information:

Course title	**Biochemistry (B)**						
Course code	**BMB-126**						
Department offering the course	**Biochemistry and Molecular Biology**						
Number of credit hours	**Theoretical**	**1**	**Practical**	**1 (2)**	**Total**	**2 (3)**	
Course Type	**Obligatory**						
Academic level	**1st Level**						
Semester	**Spring**						
Academic program	**Bachelor of Veterinary medicine (BVM)**						
Faculty	**Veterinary medicine**						
University	**Benha University**						
Name of course coordinator	**Prof. dr. / Mohammed Khaled Mahfouz**						
Specification Approval Date	**Faculty council/ 27-8-2025**						
Course Specification Approval	**Department council 8/7/2025**						

2) Course overview:

- **Course contents written in the program bylaw:**
  Chemistry of enzymes, vitamins and minerals

3) Course Learning Outcomes CLOs

	(NARS) outcomes		Course outcomes	
	Code	**Text**	**Code**	**Text**
Knowledge and understanding	**2.4**	Physiological and biochemical bases of different organ functions, metabolic processes and homeostasis.	**a1**	Identify the basic knowledge about Enzymes
			a2	Describe the basic knowledge about water soluble vitamins
			a3	Describe the basic information about fat soluble vitamins
			a4	Identify the basic information about minerals
			b1	Distinguish between: • Intracellular and extracellular enzymes. • Functional and non-functional plasma enzymes. • Modes of enzyme

				actions.
Intellectual skills	**4.4**	Proficiently secure diagnostic reasoning, develop problem lists and differential diagnosis in order to deductively and critically reach the most appropriate solution (s) and management of the addressed clinical problems.	**b2**	Distinguish between: • Energy releasing and hematopoietic vitamins • Vitamins affecting skin , bone , vision and nervous system
			b3	Judge the different classification, function of deficiency of fat soluble vitamins.
			b4	Determinate different types of macro and micro elements. Differentiate between deficiency symptoms of various minerals.
Professional and practical skills	**3.4**	Perform clinical examination of diseased cases and collect relevant samples.	**c1**	Prepare protein, urea and uric acid solutions.
			c2	Ability to prepare different chemicals and reagents needed in the experimental work.
			c3	Perform various chemical experiments to distinguish between protein solutions and urea and uric acid.
			c4	Identify type of the unknown solution.
	D			
General and transferable skills	**5.2**	Function in a multidisciplinary team.	**d1**	Self-learning during biochemistry lecture
	5.4	Organize and control tasks and resources.	**d2**	Manipulate and organize tasks
	5.5	Search for new information and technology as well as adopting life–long self-learning.	**d3**	Search for new information in biochemistry
	5.6	Utilize computer and internet skills.	**d4**	Utilize computer and internet skills, read paper

				via internet in biochemistry

4) Teaching and learning methods:

Lectures	√	**Discussion & seminar**	√	**Practical**	√
Presentation & movies	√	**Problem solving**	√	**Brain storming**	√
Others					

Course Schedule:

Number of the weeks	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours			
			Theoretical teaching (lectures/discussion groups)	Training (Practical/Clinical/ .....)	Self-learning (Tasks/ Assignments/ Projects)	Other
W1	**Nomenclature and General properties of enzymes**	**2 (3)**	**1**	**1(2)**		0
W2	**Classification of Enzymes and Enzyme specificity**	**2 (3)**	**1**	**1(2)**		0
W3	**Enzyme inhibitors and Role of enzymes in clinical diagnosis**	**2 (3)**	**1**	**1(2)**	Formative quiz	0
W4	**Isoenzymes and Chemistry of Co-enzymes**	**2 (3)**	**1**	**1(2)**		0
W5	**Chemistry and function of water sol. Vitamins**	**2 (3)**	**1**	**1(2)**		0
W6	**Chemistry and function of water sol. Vitamins**	**2 (3)**	**1**	**1(2)**	Formative quiz	0
W7	**Semester work (one hour exam)**	**----------**				
W8	**Chemistry and function of water sol. Vitamins**	**2 (3)**	**1**	**1(2)**		0
W9	**Chemistry and function of Fat sol. Vitamins (A, D)**	**2 (3)**	**2**	**1(2)**		0

W10	**Chemistry and function of Fat sol. Vitamins (E, K)**	**2 (3)**	**1**	**1(2)**	Formative quiz	0
W11	**Biochemistry of minerals (Ca, P, S, Mg)**	**2 (3)**	**1**	**1(2)**		0
W12	**Biochemistry of Electrolytes (Na, K, Cl)**	**2 (3)**	**1**	**1(2)**		0
W13	**Biochemistry of Trace Elements**	**2 (3)**	**1**	**1(2)**		0
W14	**Biochemistry of Trace Elements**	**2 (3)**	**1**	**1(2)**	Formative quiz	0
W15	**Practical exam**	**----------**				

5) Methods of students' assessment:

a- Assessment methods (summative and formative)

1. Formative assessment: including (weekly quizzes, homework assignments and surveys).
2. Summative assessment including (quizzes, class activities, semester work, practical exam, oral exams and final written exams).

b- Assessment schedule and weight

Assessment method	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Semester work including one hour exam	7th week	10	10%
Formative assessment	Through semester	------	------
Practical exam	15th week	30	30%
oral exam	End of semester	10	10%
Written exam	End of semester	50	50%
Assignments / Project /Portfolio/ Logbook	--------	-------	-------
Field training	--------	----------	-------
Other (Mention)	-------	--------	-------
Total		**100**	**100%**

6) Learning resources and supportive facilities:

Learning resources	**Main reference**	**Student Handbook:** General Biochemistry (2), Edited by Staff members. **Student practical book (2)**, Edit by Staff members

	Essential books (text books)	**a. Lippincott Illustrated Reviews: Biochemistry** (Lippincott Illustrated Reviews Series) 7th Edition. By Denise Ferrier. **b. Harper's Illustrated Biochemistry, 32nd Edition.** Peter J. Kennelly, Kathleen M. Botham, Owen P. McGuinness, Victor W. Rodwell, P. Anthony Weil. **c. Medical Biochemistry:** An Essential Textbook, 2021 , Panini (author) **d. Textbook of Biochemistry with Clinical Correlations,** Devlin Hardback, Thomas M. Devlin **e. Clinical Biochemistry and Metabolic Medicine:** 8th Edition, By Martin Crook.
	Recommended books	**A)** Bakry, M.A. (2005): Review of Medical Biochemistry. 3rd ed. **B)** Khalifa, A. (2017): Biochemistry for Medical Students. Fac. Of Med., Ain Shams Univ. **C)** Salah, E. (2003): Medical Biochemistry. 2nd. Ed. Fac. of Med., Ain Shams Univ.
	Periodicals, Web sites, . . . etc	▪ Journal of Biochemistry. ▪ American Journal of Biochemical Association. ▪ American Journal of Veterinary research. ▪ https://byjus.com/ ▪ https://www.ekb.eg/ar/home
	Learning platform	▪ Thinqi
supportive facilities:	**Devices & instruments**	**Devices** ▪ Spectrophotometer ▪ Microscope ▪ Centrifuge ▪ Water Distillator ▪ Water Bath ▪ Incubator ▪ Magnetic stirrer ▪ Vortex mixer **Instruments:** ▪ Automatic Pipette ▪ Digital balance ▪ Bottles ▪ Flasks ▪ Cylinders

		▪ Beakers ▪ Test Tubes ▪ Eppendorf's Tubes ▪ Burners
	Additional instruments	Data show White board

Matrices:

A- Content and ILOs matrix:

Topic	A) Knowledge and understanding	B) Intellectual skills	C) Professional and practical skills	D) General and transferable skills
Nomenclature and General properties of enzymes	a1	b1	c1, c2, c3, c4	d1, d2, d3,d4
Classification of Enzymes and Enzyme specificity	a1	b1	c1, c2, c3, c4	d1, d2, d3,d4
Enzyme inhibitors and Role of enzymes in clinical diagnosis	a1	b1	c1, c2, c3, c4	d1, d2, d3,d4
Isoenzymes and Chemistry of Co-enzymes	a1	b1	c1, c2, c3, c4	d1, d2, d3,d4
Chemistry and function of water sol. Vitamins	a2	b2	C3- c4	d1, d2, d3,d4
Chemistry and function of water sol. Vitamins	a2	b2	C3- c4	d1, d2, d3,d4
Chemistry and function of water sol. Vitamins	a2	b2	C3- c4	d1, d2, d3,d4
Chemistry and function of Fat sol. Vitamins (A, D)	a3	b3	C3- c4	d1, d2, d3,d4
Chemistry and function of Fat sol. Vitamins (E, K)	a3	b3	C3- c4	d1, d2, d3,d4
Biochemistry of minerals (Ca, P, S,	a4	b4	c1,c2	d1, d2, d3,d4

Mg)				
Biochemistry of Electrolytes (Na, K, Cl)	a4	b4	c1,c2	d1, d2, d3,d4
Biochemistry of Trace Elements	a4	b4	c1,c2	d1, d2, d3,d4
Biochemistry of Trace Elements	a4	b4	c1,c2	d1, d2, d3,d4

B- Teaching and learning methods and ILOs matrix:

ILOs		**Teaching and Learning method**					
		L	**P&M**	**D&S**	**P**	**Ps**	**Bs**
Knowledge and understanding	**a1**	√	√	√	√	√	√
	a2	√	√	√	√	√	√
	a3	√	√	√	√	√	√
	a4	√	√	√	√	√	√
Intellectual skills	**b1**	√		√			
	b2	√		√			
	b3	√		√			
	b4	√		√			
Professional and practical skills	**c1**				√		√
	c2				√		√
	c3				√		√
	c4				√		√
General skills	**d1**					√	√
	d2					√	√
	d3					√	√
	d4					√	√

L: Lecture, **P&M:** Presentations & Movies**, D&S:** Discussions & Seminars **P:** Practical **Ps:** Problem solving, **Bs:** Brain storming

C- Assessment methods and ILOs matrix:

ILOs		Formative assessment	Semester work (1 hr exam	**Oral**	**Practical**	**Written**
Knowledge and understanding	**a1**		√	√		√
	a2		√	√		√
	a3		√	√		√
	a4		√	√		√
Intellectual skills	**b1**	√	√	√		√

	b2	√	√	√		√
	b3	√	√	√		√
	b4	√	√	√		√
Professional and practical skills	**c1**				√	
	c2				√	
	c3				√	
	c4				√	
General skills	**d1**	√	√	√		
	d2	√	√	√		
	d3	√	√	√		
	d4	√	√	√		

- **Course coordinator:**

Prof. Dr. Mohammed Khaled Mahfouz

- **Head of Biochemistry Department:**

Prof. Dr. Afaf Desoky Abd El-Magid

- **Program Coordinator:**

Prof. Dr. Mahmoud Abed Abou Elroos