Specification for Biochemistry and Molecular Biology Course (A)
2025/2026

1) Basic information:

Course title	**Biochemistry and Molecular Biology (A)**						
Course code	**BMB-116**						
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	**Fall**						
Academic program	**Bachelor of Veterinary medicine (BVM)**						
Faculty	**Veterinary medicine**						
University	**Benha University**						
Name of course coordinator	**Prof. dr. / Hussein Abd El-Maksoud Ali**						
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:**

Molecular structure and chemistry of carbohydrates; lipids and proteins

3) Course Learning Outcomes CLOs

	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 carbohydrates
			a2	Define the basic knowledge about lipids
			a3	Give the basic information about proteins
			a4	Identify the basic information about molecular biology and recombinant DNA technology and its applications.
Intellectual skills	**4.1**	Foster critical thinking and scientific curiosity.	**b1**	Distinguish between energy producing carbohydrates and others with structural and supportive function.
			b2	Distinguish between the simple , compound and derived lipids
			b3	Judge the classification, function of amino acids and proteins
			b4	Determinate the different methods of DNA replication and RNA

				transcription.
Professional and practical skills	**3.4**	Perform clinical examination of diseased cases and collect relevant samples.	**c1**	Prepare physiological solutions of carbohydrates and lipids.
			c2	Prepare different chemicals and reagents needed in the experimental work.
			c3	Provide various chemical experiments to distinguish between sugar and fat solutions.
			c4	Hybridization and blotting techniques.
	D			
General and transferable skills	**5.1**	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 about biochemistry
	5.6	Utilize computer and internet skills.	**d4**	Utilize computer and internet skills, read paper via internet biochemistry

4) Teaching and learning methods:

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

Course Schedule:

er of the	Scientific content of the course (Course Topics)	W ee kly	Expected number of Learning Hours

			Theoretical teaching (lectures/discussion groups)	Training (Practical/Clinical/ .....)	Self-learning (Tasks/ Assignments/ Projects)	Other
W1	Chemistry and properties of Monosaccharide	2 (3)	1	1(2)		0
W2	Monosaccharide derivatives	2 (3)	1	1(2)		0
W3	Chemistry of Disaccharide	2 (3)	1	1(2)	Formative quiz	0
W4	Chemistry of Polysaccharide	2 (3)	1	1(2)		0
W5	Chemistry and Classification of fatty acids	2 (3)	1	1(2)		0
W6	Chemistry , Classification , function of simple lipids	2 (3)	1	1(2)	Formative quiz	0
W7	Semester work (one hour exam)	----------				
W8	Chemistry , Classification , function of compound lipids	2 (3)	1	1(2)		0
W9	Chemistry , Classification , function of derived lipids	2 (3)	2	1(2)		0
W10	Chemistry , Classification , properties of amino acids	2 (3)	1	1(2)	Formative quiz	0
W11	Chemistry , Classification, properties and function of proteins	2 (3)	1	1(2)		0
W12	DNA structure and function RNA structure and function Cell cycle of eukaryotic cells	2 (3)	1	1(2)		0
W13	Synthesis and replication of DNA RNA transcription and synthesis DNA mutations and repair	2 (3)	1	1(2)		0
W14	Genetic code and regulation of gene expression Recombinant DNA technology and its applications Hybridization and blotting techniques	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 (1), Edited by Staff members. **Student practical book (1)**, 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
Chemistry and properties of Monosaccharide	a1	b1	c1, c2, c3, c4	d1, d2, d3,d4
Monosaccharide derivatives	a1	b1	c1, c2, c3, c4	d1, d2, d3,d4
Chemistry of Disaccharide	a1	b1	c1, c2, c3, c4	d1, d2, d3,d4
Chemistry of Polysaccharide	a1	b1	c1, c2, c3, c4	d1, d2, d3,d4
Chemistry and Classification of fatty acids	a1	b1	c1, c2, c3, c4	d1, d2, d3,d4
Chemistry , Classification , function of simple lipids	a2	b2	C3- c4	d1, d2, d3,d4
Chemistry , Classification , function of compound lipids	a2	b2	C3- c4	d1, d2, d3,d4
Chemistry , Classification , function of derived lipids	a2	b2	C3- c4	d1, d2, d3,d4
Chemistry , Classification , properties of amino acids	a2	b2	C3- c4	d1, d2, d3,d4
Chemistry , Classification, properties and function of proteins	a3	b3	c1,c2	d1, d2, d3,d4
DNA structure and function **RNA structure and function** **Cell cycle of eukaryotic cells**	a3	b3	c1,c2	d1, d2, d3,d4
Synthesis and replication of DNA **RNA transcription and synthesis** **DNA mutations and repair**	a3	b3	c1,c2	d1, d2, d3,d4
Genetic code and regulation of gene expression **Recombinant DNA technology and its applications** **Hybridization and blotting techniques**	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			Assessment Method			
		Formative assessment	Semester work	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. Hussein Abd El-Maksoud Ali

- **Head of Biochemistry Department:**

Prof. Dr. Afaf Desoky Abd El-Magid

- **Program Coordinator:**

Prof. Dr. Mahmoud Abed Abou Elroos