Specification for Biochemistry (C)
2025/2026

1) Basic information:

Course title	**Biochemistry (C)**						
Course code	**BMB-217**						
Department offering the course	**Biochemistry and Molecular Biology**						
Number of credit hours	**Theoretical**	**2**	**Practical**	**1 (2)**	**Total**	**3 (4)**	
Course Type	**Obligatory**						
Academic level	**2nd Level**						
Semester	**Fall Semester**						
Academic program	**Bachelor of Veterinary medicine (BVM)**						
Faculty	**Veterinary medicine**						
University	**Benha University**						
Name of course coordinator	**Prof. dr. / Omnia Mahmoud Abd El-Hamid**						
Specification Approval Date	**Faculty council/ 27-8-2025**						
Course Specification Approval	**Department council**						

2) Course overview:

- **Course contents written in the program bylaw:**

Biological oxidation. Carbohydrate and lipid metabolism

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 biological oxidation, and respiratory chain.
			a2	Define the basic knowledge about Digestion, absorption, metabolism and metabolic disorders of carbohydrates
			a3	Gain the basic information about Digestion, absorption, metabolism and metabolic disorders of lipids.
	4.2	Assess and criticize, at the fundamental level, how data are derived.	**b1**	Distinguish between anabolism and catabolism of different carbohydrates.
			b2	Distinguish between anabolism and catabolism

				of simple , compound and derived lipids
Intellectual skills			**b3**	Judge the metabolic disorders of carbohydrates metabolism
Professional and practical skills	**3.4**	Perform clinical examination of diseased cases and Collect relevant samples.	**c1**	Ability to separate milk components, and to collect blood sample.
			c2	Ability to prepare different kits or chemicals, reagents needed in the experimental work.
			c3	Perform various chemical experiments to distinguish milk components.
			c4	Identify plasma components.
	D			
General and transferable skills	**5.2**	Function in a multidisciplinary team.	**d1**	Communicate effectively with lab collage during biochemistry lab session
	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 and technology
	5.6	Utilize computer and internet skills.	**d4**	Utilize computer and internet skills

4) Teaching and learning methods:

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

Course Schedule:

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			Theoretical teaching (lectures/discussion groups)	Training (Practical/Clinical/ .....)	Self-learning (Tasks/ Assignments/ Projects)	Other
W1	Biological Oxidations, Oxidative Phosphorylation and respiratory chain.	**3 (4)**	**2**	**1(2)**		0
W2	Digestion and absorption of carbohydrates, Glycolysis	**3 (4)**	**2**	**1(2)**		0
W3	Oxidative decarboxylation of carbohydrates and citric acid cycle	**3 (4)**	**2**	**1(2)**	Formative quiz	0
W4	HMP Shunt, Gluconeogenesis	**3 (4)**	**2**	**1(2)**		0
W5	Glycogenesis and Glycogenolysis	**3 (4)**	**2**	**1(2)**		0
W6	Uronic acid pathway Metabolism of other hexoses	**3 (4)**	**2**	**1(2)**	Formative quiz	0
W7	**Semester work including 1hr exam**	**----------**				
W8	Regulation of Blood sugar level Hypoglycemia and hyperglycemia	**3 (4)**	**2**	**1(2)**		0
W9	Digestion, absorption and Transport of lipids and role of lipoproteins	**3 (4)**	**2**	**1(2)**		0
W10	β-, α- and γ- Oxidation of Fatty acids	**3 (4)**	**2**	**1(2)**	Formative quiz	0
W11	Ketogenesis , ketolysis and ketosis	**3 (4)**	**2**	**1(2)**		0
W12	Cholesterol metabolism	**3 (4)**	**2**	**1(2)**		0
W13	De-novo-synthesis of Fatty acids	**3 (4)**	**2**	**1(2)**		0
W14	BioSynthesis of TAG, compound lipids Obesity and Fatty liver	**3 (4)**	**2**	**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, 1hr exam, 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 1hr exam	7th week	10	10%
Formative assessment	Throughout the 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:** Clinical Biochemistry (III), Edited by Staff members. **Student practical Clinical book (III)**, 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
Biological Oxidations, Oxidative Phosphorylation and respiratory chain.	a1	b1	c1, c2	d1, d2, d3

Digestion and absorption of carbohydrates, Glycolysis	a2	b2	c1, c2	d1, d2, d3
Oxidative decarboxylation of carbohydrates and citric acid cycle	a2	b2	c1, c2	d1, d2, d3,d4
HMP Shunt, Gluconeogenesis	a2	b2	c1, c2	d1, d2, d3
Glycogenesis and Glycogenolysis	a2	b2	c1, c2	d1, d2, d3
Uronic acid pathway Metabolism of other hexoses	a2	b2	c3- c4	d1, d2, d3
Regulation of Blood sugar level Hypoglycemia and hyperglycemia	a2	b2	c1, c2, c3, c4	d1, d2, d3,d4
Digestion, absorption and Transport of lipids and role of lipoproteins	a3	b3	c3, c4	d1, d2, d3
β-, α- and γ- Oxidation of Fatty acids	a3	b3	c3, c4	d1, d2, d3
Ketogenesis , ketolysis and ketosis	a3	b3	c1, c2	d1, d2, d3
Cholesterol metabolism	a3	b3	c1, c2	d1, d2, d3
De-novo-synthesis of Fatty acids	a3	b3	c1, c2	d1, d2, d3,d4
BioSynthesis of TAG, compound lipids Obesity and Fatty liver	a3	b3	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	√	√	√	√	√	√
Intellectual skills	b1	√		√			
	b2	√		√			
	b3	√		√			
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	Semester 1hr exam	Oral	Practical	Written
Knowledge and understanding	a1	√	√	√		√
	a2	√	√	√		√
	a3	√	√	√		√
Intellectual skills	b1	√	√	√		√
	b2	√	√	√		√
	b3	√	√	√		√
Professional and practical skills	c1				√	
	c2				√	
	c3				√	
	c4				√	
General skills	d1	√		√		
	d2	√		√		
	d3	√		√		
	d4	√		√		

- **Course coordinator:**

Prof. Dr. Omnia Mahmoud Abd El-Hamid

- **Head of Biochemistry Department:**

Prof. Dr. Afaf Desoky Abd El-Magid

- **Program Coordinator:**

Prof. Dr. Mahmoud Abed Abou Elroos