



University of Sadat City
Faculty of Veterinary Medicine
Department of Biochemistry and Chemistry of
Nutrition



Biochemistry and Chemistry of Nutrition (General) Course Specifications 2014/2015	
1-Basic information	
Course Code	213&223
Course title	Biochemistry and Chemistry of Nutrition
Academic year:	2 nd year (1 st and 2 nd semester)
Program title	Bachelor of Veterinary Medical Sciences
Contact	
hours/week/semester	Lecture: 2 hours/ week
	Practical: 2 hours/ week

2-Professional information

1- Overall aims of course
At the end of this course: students should gain the basic concepts and the essential practical skills in the field of nutrient and nucleic acid metabolism.
2- Intended learning outcomes of course (ILOs)
<u>a-Knowledge and understanding</u>
a.1. Discuss the oxidation of glucose, gluconeogenesis and metabolism of glycogen. a.2. Describe the biological oxidation. a.3. Indicate the chemical structure and the role of vitamins on the metabolism. a.4. Describe the chemical structure, mode of action and function of hormone. a.5. Study the metabolism of fatty acids and cholesterol. a.6. List the general metabolic reactions of amino acids and the interconversion of amino acids into special products. a.7. Show the structure of nucleic acids. a.8. List the precaution for collection and storage of various body fluids, and Clarify the biochemical pathways of detoxification.

b-Intellectual skills

- b.1. Explore the relationship between different metabolic pathways in the body.
- b.2 Identify the metabolic disorders.
- b.3. Investigate the biochemical analysis of the urine.
- b.4. Detect the nutritional deficiency diseases.
- b.5. Classify the disorders of nutrients metabolism.
- b.6. Explore the biochemical pathways of detoxification.
- b.7. Explain the disorders of nucleic acids metabolism.

c-Professional and practical skills

- c.1. Calculate of hydrogen ions concentration of chemical and biological solutions.
- c.2. Prepare chemical solutions with different concentrations.
- c.2. Determine glucose level in blood and urine.
- c.3. Discover of chloride in urine.
- c.4. Explore of normal and abnormal constituents of urine.
- c.5. Investigate DNA and RNA.

d-General and transferable skill

- d.1. Handle computer and internet skills in editing and presentations.
- d.2. Write reports efficiently.
- d.3. Work in team.
- d.4. Program the time efficiently.
- d.5. Incorporate with others effectively.

3-Topics and contents

3a. First semester

Topic	No. of hours		
	Lectures	Practical	Total
Carbohydrate metabolism	12	-	36
Measure hydrogen Ion concentration in solution		4	
Prepare chemical solution with different concentrations		4	
Measurement unites		4	
Spectrophotometer and how to use it		4	
Estimate glucose level in blood		4	
Estimate glucose level in urine		4	
Biological oxidation . Respiratory chain . Oxidative phosphorylation	2	-	2
Vitamin chemistry . Classification of Vitamis . Study the individual vitamin chemical structure, source, biochemical function, and deficiency diseases.	8	-	8
Hormone chemistry . Classification of hormones Chemical structures and synthesis of hormones Mechanism of hormone actions	4	-	4
Mineral metabolism . Classification of mineral element . Study source, absorption, function, body requirements, excretion, disease condition resulted from deficiency of each element	4	6	10
	30	30	60

Animal pigments . Carotenoid pigment . Porphyrin pigment . Bile pigment . Melanin pigment	2	-	2
Body fluids . Urine Urine formation Collection of urine sample Physical properties of urine Chemical constituents of normal urine Abnormal constituents of urine	2	12	16
Putrification and Detoxifications . Putrification . Xenobiotics . Detoxifications mechanism	2	-	2
Nucleic acid metabolism <ul style="list-style-type: none"> • Nucleic acids: structure and function • DNA metabolism • RNA metabolism • Protein synthesis How to collect and preserve biological samples Isolate DNA Isolate RNA PCR Electrophoresis	6	10	16
	30	30	60

4- Teaching and learning methods

4.1 Lectures.

4.2 Practical.

4.3 Self-learning activities.

5-Student assessment

5.1. Assessments methods

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U (a)	I.S (b)	P&P.S (c)	G.S (d)
Student activities and periodical exam	a 1, 2, 3	b 1, 2, 3	-	1-5
	a 6, 7	b 1, 2, 4, 5		
Practical exam	-	-	C1,2, 3,4, 5,	-
Written exam	a 1, 3, 4, 5, 6,7,8	b 2, 4, 5,6 7	-	
Oral exam	a 6,7,8	b 1, 3, 5	-	-

5.2-Assessment schedules/semester

Assessments methods	Time of Assessments
Student activities	along the semester
Periodical exam.	8 th Week
Practical exam.	16 ^h Week
Final-Term exam. (written exam)	16 th Week
Oral exam	16 th Week

6.3-Weight of assessments

Assessment	Allocated Mark		
	1 st Semester	2 nd Semester	Total
Student activities and periodical exam	5	5	10
Practical exam	10	10	20
Final-Term exam (written exam)	25	25	50
Oral exam	10	10	20
Total	50	50	100

7- List of references
<u>7.1. Departmental Notes</u>
Handbook of Veterinary Biochemistry.
<u>7.2. Essential books</u>
Bhagavan, N. V. : Medical biochemistry, Academic Press 4 th edition (2001) Lppincotts biochemistry Williams and Wilkins; 3rd edition (2004)
<u>7.3. Recommended texts</u>
<ul style="list-style-type: none"> • Harper's Biochemistry, Peter A. Mayes , Robert K. Murray , Daryl K. Granner (1999). • Lehninger, Principles of Biochemistry. David L. Nelson, Michael M. Cox. 4th edition, (2004). • Molecular Biology Of The Cell. Bruce Alberts, Alexender Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter. Fourth edition, (2007).
<u>7.4. Journals , Websitesetc</u>
<u>Journals:</u>

- ❖ Science
- ❖ Cell
- ❖ Biochem Biophys Res Commun
- ❖ J Biol Chem
- ❖ Biochem J
- ❖ Int J Biochem Cell Biol
- ❖ J. of Applied Biochemistry.
- ❖ J. of comparative Biochemistry & Physiology
- ❖ J. of biochemical and biophysical Acta.

Course coordinator: Dr. Mabrouk Attia Abd Eldaim

Head of department: Prof. Dr. Shabaan Gadallah

Matrix alignment of the course topics and ILOs

FIRST SEMESTER

Topic	No. of hours /week		Total hours /semester	Hours for lect.	Hours for pract.	ILOs				T&L.methods				
	Lect.	Pract.				K&U (a)	I.S (b)	P.P.S (c)	G.T.S (d)	Lect.	Pract.	Self& active learning	Audiovisual	Case study
Carbohydrate metabolism	2	2	36	12	24	1	1,2,4,5	2,5	1,2,3,4	√	√	√	√	
Biological oxidation	2	-	2	2	-	2	5	1	1,2,3,4	√		√	√	
Vitamin chemistry	2	-	8	8	-	3	1,2,4,5		1,2,3,4,5	√		√	√	
Hormone chemistry	2	-	4	4	-	4	2		1,2,3,4	√	√	√	√	
Mineral metabolism	2	2	10	4	6	6	2,4	3, 5	1,2,3,4	√	√	√	√	

SECOND SEMESTER

Topic	No. of hours /week		Total hours /semester	Hours for lect.	Hours for Pract.	ILOs				T&L. methods				
	Lect.	Pract.				K&U (a)	I.S (b)	P.P.S (c)	G.T.S (d)	Lect.	Pract.	Self& active leaning	Audiovisual	Case study
Protein metabolism	2	2	14	10	4	6,7	1,2,4,5	5	1,2,3,4,5	√		√	√	
Lipid metabolism	2	2	10	6	4	5	1,2,4,5	5	1,2,3,4,5	√		√	√	
Animal pigments	2	-	2	2	-	5	2,4,5	5	1,2,3,4,5	√		√	√	
Body fluids	2	2	16	4	12	8	3	2,3,4,5	1,2,3,4	√	√	√	√	
Putrefaction and Detoxifications	2	-	2	2	-	3	2,7		1,2,3,4	√		√	√	
Molecular biology	2	2	16	6	10	7	2,8	5	1,2,3,4	√	√	√	√	