# Course Specification

### **Biochemistry (A)**

# Respiratory chain and Metabolism of Carbohydrates and Lipids Benha University Faculty of Veterinary Medicine

Program on which the course is given: Bachelor of Veterinary Medical Science

Department offering the course: **Department of Biochemistry** 

Academic year / Level: 2<sup>nd</sup> Year

Date of specification approval: Ministerial Decree No 921, on 15/9/1987.

(Then approved in this recent template by department council on 23/9/2006)

#### **A- Basic Information**

Title: Biochemistry Code: Vet 00624 a

**Lecture: 2 hours** 

Practical: 4 hours Total: 6 hours

#### **B- Professional Information**

#### 1 – Overall Aims of Course:

The aim of the course is to provide the students with a basic education in the Respiratory chain and Metabolism of Carbohydrates and Lipids.

#### 2 – Intended Learning Outcomes of Course (ILOs)

#### a- Knowledge and Understanding:

- a1- Enumerate basic knowledge about cellular energy production.
- a2- Understand basis of the metabolism and energy.
- a3- Illustrate basis of the Anabolism.
- a4- Recognize basis of Catabolism.
- a5- Interpret basis of metabolic disturbances.

#### **b-Intellectual Skills**

By the end of the course, students should be able to:

- b1- Recognize the nature of energy in the living cells
- b2- summerize the relations between the metabolism and diseases
- b3- Judge the changes between the microbial and metabolic diseases

#### c-Professional and Practical Skills

- c1- Explain how the cell gain energy
- c2-Demonstrate differentiations between the normal and abnormal metabolic pathways
- c3-Acquiring Knowledge about the normal homeostasis of the cellular functions

#### d-General and Transferable Skills

- d1- Able to be a successful member chemists.
- d2- Presentation of a scientific study in medical laboratories .
- d3- Scientific chemists terms.

# **3- Contents**

Topic	No. of	Lecture	
	hours		Practical
Biological Oxidations	1	1	-
Oxidative Phosphorelation	10	2	8
High energy bonds	9	1	8
Absorption of carbohydrates	10	2	8
Aerobic oxidation of	1	1	-
carbohydrates			
Anaerobic oxidation of	1	1	-
carbohydrates			
Glycogenolysis and	10	2	8
Glycogenesis			
Gluconeogenesis	8	2	6
Blood sugar level	8	2	6
Glucosuria	2	2	-
Absorption of lipids	2	2	-
Transport of lipids and role	6	2	4
of lipoproteins			
Oxidation of Fatty acids	2	2	-
Biosynthesis of Fatty acids	10	2	8
Depot fat biosynthesis	6	2	4
Obesity	2	2	-
Fatty liver	2	2	-
Total	90	30	60

## 4- content-ILOs matrix

	Content	ILOs			
		Knowledge	Intellectual	Professional	General and
		and		and practical	transferable
		understanding			
1.	Biological		b1, b2,b3	c1, c2, c3	d1, d2,
	Oxidations	a4,			
2.	Oxidative		b1, b2,b3	c1, c2, c3	d1, d2, d3,d4,
	Phosphorelation	a1, a2, a3			
3.	High energy	a1, a2, a3,	b1, b2,b3	c1, c2, c3	d1, d2, d3,d4,
	bonds				
4.	Absorption of	a1, a2, a3	b1, b2,b3	c1, c2, c3	d1, d2, d3,d4
	carbohydrates				
5.	Aerobic oxidation	a1, a2, a3	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4
	of carbohydrates				

6.	Anaerobic	a1, a2, a3	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4
	oxidation of carboh				
7.	Glycogenolysis	a1, a2, a3,	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4,
	and Glycogenesis				
8.	Gluconeogenesis	a1, a2, a3,	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4
9.	Blood sugar level	a1, a2, a3,	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4
10.	Glucosuria	a1, a2, a3	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4
11.	Absorption of	a1, a2, a3,	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4
	lipids				
12.	Transport of lipids	a1, a6	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4,
	and role of lipoprote				
13.	Oxidation of Fatty	a1, a2, a3	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4,
	acids				
14.	Biosynthesis of	a1, a2, a3	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4,
	Fatty acids				
15.	Depot fat	a1, a2, a3	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4
	biosynthesis				
16.	Obesity	a1, a2, a3	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4
17.	Fatty liver	a1, a2, a3	b1, b2,b3	c1, c2, c3	d1, d2, d3, d4,

#### 5- Assessment-ILOS matrix

Assessment	ILOs			
	Knowledge	Intellectual	Professional	General and
	and		and practical	transferable
	understanding			
Mid – Term exam	a2, a3, a4	b1, b2		
Practical exam	a1	b1, b2,b3,	c1, c2, c3	
Oral exam	a1, a2, a3	b1, b2,b3		
Final term exam	a2, a3, a4,	b1, b2,b3,	c1, c2, c3	
Assignments and	a4	<b>b</b> 1		d1, d2, d3,d4,
research				

# 6- Teaching and Learning Methods

Lectures and lab sessions in which the following facilities are used:

- 4.1- Blackboards and chocks
- 4.2- Whiteboards and markers
- 4.3- Over head projector transparent sheets
- 4.4- Demonstration of chemical reactions.

## **<u>5- Student Assessment Methods</u>**

- 5.1 Practical exam to assess professional and practical skills.
- 5.2 Oral exam to assess knowledge, transferable and intellectual skills.
- 5.3 Written exam to assess knowledge, understanding and intellectual skills.
- 5.4 Quiz and semester work to assess understanding, practical and transferable skills.

#### **Assessment Schedule**

Assessment 1	Quiz Examination	Week	6
Assessment 2	Written Examination	Week	15
Assessment 3	Oral Examination.	Week.	15
Assessment 4	<b>Practical Examination</b>	Week	13
Assessment 5	Semester Work	Week	13

#### **Weighting of Assessments**

5 %	Quiz Examination
50 %	Written Examination
20 %	Oral Examination.
20 %	<b>Practical Examination</b>
5 %	Semester Work

100% Total

#### 7- List of References

#### 7.1- Course Notes

A concise guid of Metabolism

## 7.2- Essential Books (Text Books)

Devlin, T.M.(1993): Textbook of Biochemistry: With Clinical Correlation. 3rd ed. (4th printing). Wiley-Liss: A John Wiley & Sons, Inc., Puplication: New York,

Murray, R.K.; Granner, D.K.; Mayes, P.A. and Rodwell, V.W. (1996): Harper's of Biochemistry. 24th ed. Appleton & Lange. Norwalk, Connexticut, Loss Atlos, California.

Zilva, M.; Charles, F. and Myne, N. (1993): Clinical Chemistry in Diagnosis and Treatment. 6th ed. Saunders, Philadelphia, U.S.A.

#### 7.3- Recommended Books

Bakry, M.A. (1995): Review of Medical Biochemistry. 3rd ed.

Khalifa, A. (1997): Biochemistry for Medical Students. Fac. of Med., Ain Shams Univ.

Salah, E. (1993): Medical Biochemistry. 2nd ed. Fac. of Med., Ain Shams Univ.

Zahran, M.A. (1994): Lectures on Medical Biochemistry. Alexandria Univ.

#### 7.4- Periodicals, Web Sites, ... etc

Journal of Biochemistry
American Journal of Biochemical Association.
American Journal of Veterinary Research.

## 8- Facilities Required for Teaching and Learning

Biochemistry laboratory. Routine Biochemical kit. Faculty central laboratory. Computer and internet lab.

**Course Coordinator: Prof Dr. Hussien Abd Al-Maksoud** 

**Head of Department: Prof Dr. Hussien Abd Al-Maksoud** 

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