



**Beni Suef University**  
**Faculty of Veterinary Medicine**  
**Department of Biochemistry**

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**Program Specification for Master Degree**  
**2017-2018**

**A-Basic information:**

**1- Program title:** *MVSC.*,

**2- Program type:** *Single*

**3- Department offering program:** **Biochemistry**

**4-Academic year:** *2017-2018*

5-Approval date of Department Council:

**6-Approval date of Faculty Council:**

**7-External evaluator:**

**B-Professional information:**

**1- Overall aims of the program:**

- 1- Provide graduates the opportunity to develop communication skills with supervisors and collages.
- 2- Enable graduates to achieve competency in modern laboratory technology in different branches of biochemistry.
- 3- Allow graduates to develop practical research project according to research plan of the biochemistry department.
- 4- Develop the ability of graduate to engage critically with scientific literature and to critically review and present their own research data.
- 5- To ensure that graduates reserve a comprehensive theoretical base in biochemistry, molecular biology and biotechnology.
- 4- To provide graduates with knowledge, skills and confidence to enable them to pursue a career in the field of biochemistry and molecular biology.

**2- Intended learning outcomes of course (ILOs):**

**a- Knowledge and understanding:**

**On successful completion of this program the graduate should be able to :**

- a1- Understand the metabolism of various food stuffs.
- a2- Understand main processes of gene expression and molecular biology techniques.
- a3- Understand formation and composition of each body fluid.
- a4- Describe chemical structure of biological membranes and mechanism of transport of

molecules across them.

a5-Recognize biochemical mechanism of apoptosis and carcinogenesis.

a6-Describe biochemical structure of hormones and its role in regulation of metabolism and reproduction in mammals, avian and fish.

a7-Recognize the biochemical importance of minerals and vitamins in metabolism in mammals, avian and fish.

#### **b- Intellectual skills:**

**On successful completion of master program the graduate should be able to:**

b1- Identify , conceptualize and define research problems and questions according to research plan of biochemistry department.

b2- Critically evaluate their own research data and develop new approach to solving their research questions.

b3- Develop creative approaches to solving technical problems or issues associate with running and researches project.

b4- Identify , summarize and evaluate prior researches finding in a specific area

#### **c- Professional and practical skills:**

**On successful completion of this program the graduate should be able to:**

c1- Apply the principles of good experimental design and analysis to their own research project .

c2- Select and perform relevant statistical analysis on data obtained for their own research .

c3- Practice on collection of different body fluids samples for measurement of different biochemical parameters for diagnosis of abnormalities of metabolism of macro- and micromolecules.

c4. Use new techniques for different biochemical analysis as PCR.

#### **d- General and transferable skills:**

**On successful completion of this program the graduate should be able to:**

d1. Summarize research findings in oral presentations and workshops.

d2. Communicate effectively with supervisors.

d3. Improve computer and internet search skills.

#### **3- Academic standers:**

\* The faculty mission, vision and strategic objective are confirmed to the academic standard. The learning outcomes are in line with the department and the faculty mission.

\* Postgraduates NARS (March 2009) Master degree chapter issued by national authority for quality assurance and accreditation of education (NAQAAE) and Veterinary medicine post graduate academic standards (ARS) for the faculty of veterinary medicine,

Beni-Suef University, Beni-Suef, Egypt are selected to confirm the appropriateness of the academic standards .

#### 4- Program Structure and Contents

**A- Program duration:** At least two academic years from the approval of registration by the Faculty Council and maximum four years. The faculty council has the right to give the applicant another period not exceed two years according to the supervisor request

The first year for preliminary courses study, while the second year for researches and preparation of the Master Thesis.

**B- Program structure: Hours/ week:**

**Basic course:-**

Theoretical  Practical  Total

**Subsidiary courses:-**

Theoretical  Practical  Total

**Master Thesis: completed during the second academic year.**

**C- Program courses:**

**1- basic courses**

Code	Course title	Hours /week		Academic year	Teaching duration
		theoretical	practical		
	Master Principal course	3	4	Preliminary year	36 weeks
	Research methods	1	3	Preliminary year	36 weeks

**2-subsidiary courses**

Code	Course title	Hours /week		Academic year	Semester
		theoretical	practical		
	Selected (3-5) courses depending on the thesis title from the various Faculty Master courses other than specialty of the Master.	5-6	6-9	Preliminary year	36 weeks

#### D- Courses contents

See master courses specification

#### 5- Program Admission Requirements

a- According to the Faculty of Veterinary Medicine, Beni-Suef University Bylaws for Post Graduate Programs, applicants should have BVSc., from an Egyptian University or equivalent degree from any approved university, with at least general grade (Good) and (Very Good) in the specialized subject.

b- Also if the student has postgraduate diploma in one specialization of total (3 hours) at least with general grade (Good) and (Very good) in the specialized subject.

c- According to Beni-Suef University requirements, all applicants for postgraduate studies should fulfill preliminary courses on the following subjects:

1- English language (Toefl or equivalent degree)

2- Computer skills (ICDL) or equivalent computer course.

d- Admission to the program is open during March and September annually after at least one year from the BVSc degree.

#### 6. Regulations for Progression and Program Completion

After finishing the preliminary courses, the graduate student will be eligible to sit for the examination according to the following roles:

No. of course teaching hours/ week	Allowed time for written exam.	Degree	
		Theoretical	Practical and oral exam
$\geq 3$ hours	3 hours	50	50
$\leq 3$ hours	2 hours	25	25

- It is mandatory to pass all the courses each chance except biostatic (212)

-The passing mark in each exam is  $\geq 60\%$ .

-The faculty council has the right to deprive the applicant from entering the exams

if his attendance courses is less than 75% .

### Qualification grades:

<b>Excellent</b>	$\geq 90$
<b>Very good</b>	$\geq 80$
<b>Good</b>	$\geq 70$
<b>Pass</b>	$\geq 60$
<b>Failed</b>	45 to less than 60 weak
	Less than 45 Very weak

-After passing, the graduate starts research for Master Thesis at the beginning of the second year.

-The candidate will receive his degree after evaluating and approving the thesis by a committee according to University regulations.

-The applicant should publish at least two scientific papers from the thesis in local or international journals

## 7-Graduate student assessment

### A: Assessment Tools

According the Faculty of Veterinary Medicine, Beni-Suef University Bylaws for Post Graduate, students should be assessed at the end of preliminary year and the thesis should be evaluated and approved by a committee according to University regulations.

### 1-Preliminary year

<b>Assessments methods for each course</b>	<b>practical exam</b>	<b>Oral exam</b>	<b>Written exam</b>
<b>Time of Assessments</b>	By the end of the year	By the end of the year	By the end of the year
<b>Marks</b>	25	25	50

### 2-Master Thesis:

All master-degree students should prepare a thesis in Biochemistry. The department council must approve the protocol (plan) of the research. The thesis is supervised by one or more staff members and may include other specialties according to the nature of the research. The thesis should be evaluated and approved by a committee according to University regulations. The applicant should publish at least one scientific paper from the thesis in local or international journals.

## B- Matrix alignment of the measured ILOs

Assessments methods	Matrix alignment of the measured ILOs			
	K&U (a)	I.S (b)	P&P. S (c)	G&T. S (d)
written exam	a1-a7	b1, b4		d1, d3
Practical exam			c1-c4	
Oral exam	a1-a7	b1,b4		d1, d3

**Course coordinator**  
**Dr. Eman Taha Mohamed**

**Head of the Department**  
**Prof.Dr.Mohamed Ahmed Kandeil**

### Program course ILOs matrix

Topic	K.U(a)	I.S(b)	P.P.S (c)	G.T.S (d)
Introduction to biochemistry	a1	b1,b2,b3	c1	d1 – d3
Chemistry and metabolism of carbohydrates	a1	b1,b2,b3, b4	c1	d1 – d3
Chemistry and metabolism of lipids	a1	b1,b2,b3, b4	c1,c3	d1 – d3
Chemistry and metabolism of amino acids and protein	a1	b1,b2,b3, b4	c1,c3,c4	d1 – d3
Chemistry and metabolism of purine and pyrimidine nucleotides	a1	b1,b2,b3, b4	c1, ,c3	d1 – d3
Metabolism of porphyrin, heme and hemoglobin	a1	b1,b2,b3, b4	c1, ,c3	d1 – d3
Metabolism of mineral	a1,a4,a7	b1,b2,b3	c1, ,c3	d1 – d3
Metabolism of xenobiotics	a1,a2,a4	b1,b2,b3		d1 – d3
Biochemistry of Enzymes	a2	b1,b2,b3	c1, ,c3	d1 – d3
Biochemistry of Vitamins	a1,a3,a7	b1,b2,b3	c1, ,c3	d1 – d3
Immunochemistry	a3	b1,b2,b3	C4	d1 – d3
Biological membranes biochemical structure and function	a3	b1,b2,b3	-	d1 – d3
Biochemistry of Hormones and basics of cellular signaling	a2,a4,a6	b1,b2,b3, b4	c1, ,c3	d1 – d3
Basics of Molecular Biology	a2	b1,b2,b3	C4	d1 – d3
Molecular cloning and other molecular biological techniques	a2	b1,b2,b3	C4	d1 – d3
Cell cycle, apoptosis and Carcinogenesis	a2,a5	b1,b2,b3	C4	d1 – d3
Biochemistry of Body fluids (Blood, Milk,Urine,Semen)	a3	b1,b2,b3	c1, ,c3	d1 – d6

## Master Program Specification Matrix (Program Courses with ILOS)

Program ILOS	Courses
<b>Knowledge and understanding</b>	
a1	M-35, M38 & thesis
a2	M-34, M42 & thesis
a3	M-36, M39 & thesis
a4	M-34, M 36 & thesis
a5	M-34, M 39 & thesis
a6	M-34, M 37, M40, M41 & thesis
a7	M-34, M 40, M41 & thesis
<b>Intellectual skills</b>	
b1	M-34- M43 & thesis
b2	M-34- M43 & thesis
b3	M-34- M43 & thesis
b4	M-34- M43 & thesis
<b>Professional and practical skill</b>	
c1	M-34- M43 & thesis
c2	M-34-M43 & thesis
c3	M-34-M43 & thesis
c4	M-34-M42 & thesis
<b>General and transferable skills</b>	
d1	M-34- M43 & thesis
d2	M-34- M43 & thesis
d3	M-34-M43 & thesis



## Program aims – ILOS Matrix for the Master program (MVSc)

Program ILOS		Program ILOS				
		Program aims				
		1-Provide graduates the opportunity to develop communication skills with supervisors and collages	2-Enable graduates to achieve competency in modern laboratory technology in different branches of biochemistry.	3- Allow graduates to develop practical research project according to research plan of the biochemistry department.	4-Develop the ability of graduate to engage critically with scientific literature and to critically review and present their own research data.	5- To ensure that graduates reserve a comprehensive theoretical base in biochemistry, molecular biology and biotechnology.
Knowledge and understanding	a1- Understand the metabolism of various food stuffs.		√			√
	a2- Understand main processes of gene expression and molecular biology techniques.		√			√
	a3- Understand formation and composition of each body fluid.		√			√
	a4- Describe chemical structure of biological membranes and mechanism of transport of molecules across them.		√			√
	a5-Recognize biochemical mechanism of apoptosis and carcinogenesis.		√			√
	a6-Describe biochemical structure of hormones and its role in regulation of metabolism and reproduction in mammals, avian and fish.		√			√
	a7-Recognize the biochemical importance of minerals and		√			√

Program ILOs		Program aims				
		1-Provide graduates the opportunity to develop communication skills with supervisors and collages	2-Enable graduates to achieve competency in modern laboratory technology in different branches of biochemistry.	3- Allow graduates to develop practical research project according to research plan of the biochemistry department.	4-Develop the ability of graduate to engage critically with scientific literature and to critically review and present their own research data.	5- To ensure that graduates reserve a comprehensive theoretical base in biochemistry, molecular biology and biotechnology.
	vitamins in metabolism in mammals, avian and fish.					
Intellectual skills	b1- Identify , conceptualize and define research problems and questions according to research plan of biochemistry department.	√		√		
	b2- Critically evaluate their own research data and develop new approach to solving their research questions.	√			√	
	b3- Develop creative approaches to solving technical problems or issues associate with running and researches project.	√			√	
	b4- Identify , summarize and evaluate prior researches finding in a specific area	√			√	
Practical and professional skills	c1- Apply the principles of good experimental design and analysis to their own research project .	√			√	
	c2- Select and perform relevant statistical analysis on data obtained for their own research .	√			√	
	c3- Practice on collection of different body fluids samples		√			√

Program ILOs		Program aims				
		1-Provide graduates the opportunity to develop communication skills with supervisors and collages	2-Enable graduates to achieve competency in modern laboratory technology in different branches of biochemistry.	3- Allow graduates to develop practical research project according to research plan of the biochemistry department.	4-Develop the ability of graduate to engage critically with scientific literature and to critically review and present their own research data.	5- To ensure that graduates reserve a comprehensive theoretical base in biochemistry, molecular biology and biotechnology.
	for measurement of different biochemical parameters for diagnosis of abnormalities of metabolism of macro- and micromolecules.					
	c4. Use new techniques for different biochemical analysis as PCR.		√			√
General and transferable skills	d1. Summarize research findings in oral presentations and workshops.	√		√		
	d2. Communicate effectively with supervisors.	√				√
	d3. Improve computer and internet search skills		√		√	

## Master Program Specification Matrix (Program ILOS with Academic standers ARS)

Academic standers	Program ILOs	Knowledge and understanding						Intellectual skills							Professional and practical skills				General and transferable skills							
		a 1	a 2	a 3	a 4	a 5	a 6	b 1	b 2	b 3	b 4	b 5	b 6	b 7	c1	c2	c3	c4	d 1	d 2	d 3	d 4	d 5	d 6	d 7	
Knowledge and understanding	a1				x																					
	a2	x			x																					
	a3				x																					
	a4			x		x																				
	a5			x																						
	a6		x	x		x	x																			
	a7		x	x																						
Intellectual skills	b1						x			x																
	b2							x																		
	b3								x		x	x														
	b4													x												
Professional and practical skills	c1													x			x									
	c2														x											
	c3															x										
	c4															x										
General and transferable skills	d1																	x			x	x				
	d2																	x						x		
	d3																			x					x	



Beni-Suef University  
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## Course specification of postgraduate

### 1-Basic information

<b>Course Code:</b>	MBC BIOC
<b>Course title :</b>	Fundamentals of biochemistry
<b>Program title:</b>	Master degree In Veterinary Medical Sciences (biochemistry)
<b>Contact hours/ week</b>	4hr./week (3hr. lecture & 4hr. practical)
<b>Approval Date</b>	

### 2-Professional information

**Overall aims of course:**

**This course aims to:**

- 1- Provide graduates the opportunity to develop research skills
- 2- Provide graduate with skills in interpretation of the published literature to prepare them to assimilate and incorporate new developments into research and clinical activities
- 3- To ensure that graduates reserve a comprehensive theoretical base in biochemistry and molecular biology.
- 4- To provide graduates with knowledge, skills and confidence to enable them to pursue a career in the field of biochemistry and molecular biology.

### 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

**By the end of this course the student should be able to:**

- a1- Understand the metabolism of various food stuffs.
- a2- Identify factors affecting enzyme activity and the uses of enzymes in clinical diagnosis.
- a3- Discuss various vitamins and their deficiency diseases.
- a4- Identify role of various hormones, growth factors and neurotransmitters in cell signaling.
- a5- Understand main processes of gene expression and their regulation.
- a6- Identify chemical structure of biological membranes and mechanism of transport of molecules across them.
- a7- Understand the process of cell cycle and its relation to carcinogenesis.
- a8- Understand the basics of cellular and humoral immunity.
- a9- Understand formation and composition of each body fluid.
- a10- Understand the principles and steps of various molecular biological techniques.

**b-Intellectual skills**

**By the end of this course the student should be able to:**

- b1. Critically evaluate their own research data and develop new approach to solving their research questions
- b2. Develop creative approaches to solving technical problems or issues associate with running and researches project.



## Course specification of postgraduate

- b3. Identify, summarize and evaluate prior research findings in a specific area
- b4. Compare between biosynthesis and Breakdown of various macromolecules.
- b5. Categorize functional and nonfunctional enzymes of blood plasma and their usefulness in diagnosis of the diseases.
- b6. Distinguish between each pairs of the following: water soluble and fat soluble vitamins, various types of immunoglobulins, macrominerals and microminerals and phase I and phase II of metabolism of xenobiotics.
- b7. Relate the DNA replication to the cell cycle and apoptosis.
- b8. Differentiate between steps and regulation of DNA transcription and translation in prokaryotes and eukaryotes.

### **C- Professional and practical skills**

**By the end of this course the student should be able to:**

- c1. Measure blood plasma parameters elevated in abnormalities of metabolism of macro- and micromolecules.
- c2. Perform a run of PCR .
- c3. Measure lipid profiles in blood plasma.
- c4. Measure various blood plasma enzymes.
- c5. Measure various electrolytes in blood plasma.
- c6. Perform analysis of urine, semen and CSF.
- c7. Interpret laboratory results and correlate them to various diseases.
- c8. use statistical techniques in analyzing data.

### **d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

- d1. Summarize research findings in oral presentations and workshops.
- d2. Communicate effectively with supervisors.
- d3. Demonstrate information retrieval and library skills.
- d4. Be kind with Experimental animals during experimentation.
- d5. Encourage graduates for cooperation with colleagues.
- d6. Improve computer and internet search skills.

## 4-Topics and contents

Course	Topic	No. of hours	Lectures	Practical
Fundamentals of biochemistry (Lec. 3hr./week, Pract 4h./week)	Introduction to biochemistry	5	2	3
	Chemistry and metabolism of carbohydrates	37	18	19
	Chemistry and metabolism of lipids	25	12	13
	Chemistry and metabolism amino acids and protein	37	18	19
	Chemistry and metabolism of purine and pyrimidine nucleotides metabolism	13	6	7



## Course specification of postgraduate

Metabolism of porphyrin, heme and hemoglobin metabolism	15	7	8
Metabolism of mineral metabolism	13	6	7
Metabolism of xenobiotics	4	1	3
Enzymes	13	6	7
Vitamins	17	8	9
Immunochemistry	5	2	3
Biological membranes	5	2	3
Hormones and basics of cellular signaling	13	6	7
Basics of Molecular Biology	11	5	6
Molecular cloning and other molecular biological techniques	13	6	7
Cell cycle, apoptosis and Carcinogenesis	9	4	5
Body fluids	17	8	9
<b>Total</b>	<b>252</b>	<b>108</b>	<b>144</b>

### 5-Teaching and learning methods

- 5.1- Lectures (brain storm, discussion) using board, data shows  
 5.2- Self learning by preparing essays and presentations (computer researches and library)  
 5.3- Practical (models, samples and Practical classes: in which the demonstrators help the students to perform the laboratory tests by themselves).

### 7-Student assessment

#### 7.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
Final Exam	<b>a1 – a10</b>	<b>b1 – b8</b>		
Practical Exam	<b>a1 – a10</b>		<b>c1 – c8</b>	
Oral Exam	<b>a1 – a10</b>	<b>b1 – b8</b>	<b>c1 – c8</b>	<b>d1 – d6</b>

#### 7.2. Assessment schedules

Method	Week(s)
Practical exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
Final exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
Oral exam	During 45 <sup>th</sup> week -48 <sup>th</sup> week

#### 7.3. Weight of assessments



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Assessment	Weight of assessment
Practical exams	25%
Final exams	50%
Oral exam	25%
total	100%

### **8- List of references**

#### **8.1. Notes and books**

-Note book of biochemistry part I&II by staff members of biochemistry department.

#### **8.2. Essential books:**

- 1-Robert Murray, Victor Rodwell, David Bender, Kathleen M. Botham, P. Anthony Weil, Peter J. Kennelly. Harper's Illustrated Biochemistry, 28th Edition, 2009.
- 2- Richard Harvey, Denise Ferrier. Lippincott's Illustrated Reviews: Biochemistry. 5 th Edition. 2010.
- 3-Thomas M. Devlin. Textbook of Biochemistry with Clinical Correlations. 6 th Edition. 2005.

#### **8.3. Recommended texts**

- 1-David L. Nelson, Michael M. Cox. Lehninger Principles of Biochemistry. 4 th Edition. 2004.
- 2- Donald Voet , Judith G. Voet . Biochemistry. 4 th Edition. 2010.
- 3- Eugene C. Toy, Jr., William E Seifert , Henry W. Strobel, Konrad P. Harms. Case Files: Biochemistry. 1 st Edition. 2005.
- 4- Lubert Stryer , Jeremy M. Berg , John L. Tymoczko . Biochemistry. 5th Revised edition. 2002.

#### **8.4. Journals, Websites .....etc**

##### **Journals:**

- 1- Egyptian J. of Biochemistry and molecular biology. Cairo, Egypt.
- 2- Biochemical journal.
- 3- Journal of biochemistry and molecular biology.

##### **Websites:**

WWW.Science direct  
WWW. Pubmed.com  
WWW.Scholar google.com  
WWW.welly interscience

**Course Coordinators**  
**Dr. Eman Taha Mohamed**

**Head of Department**  
**Prof.Dr.Mohamed Ahmed Kandeil**





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**Course Matrix for Achievement of Intended Learning Outcomes**

Topics		Wk	Knowledge and Understanding	Intellectual Skills	Practical and Professional Skills	General & Transferable Skills
1	Introduction to biochemistry	1	a1	b1,b2,b3	c1, c7, c8	d1 – d6
2	Chemistry and metabolism of carbohydrates	2- 5	a1	b1,b2,b3, b4	c1, c7, c8	d1 – d6
3	Chemistry and metabolism of lipids	6 - 9	a1	b1,b2,b3, b4	c1,c3, c7, c8	d1 – d6
4	Chemistry and metabolism amino acids and protein	10 - 13	a1	b1,b2,b3, b4	c1, c7, c8	d1 – d6
5	Chemistry and metabolism of purine and pyrimidine nucleotides metabolism	14 - 16	a1	b1,b2,b3, b4	c1, c7, c8	d1 – d6
6	Metabolism of porphyrin, heme and hemoglobin metabolism	17 - 19	a1	b1,b2,b3, b4	c1, c7, c8	d1 – d6
7	Metabolism of mineral metabolism	20 - 21	a1	b1,b2,b3	c1,c5, c7, c8	d1 – d6
8	Metabolism of xenobiotics	22	a1	b1,b2,b3, b6	c6, c7, c8	d1 – d6
9	Enzymes	22 - 24	a2	b1,b2,b3, b5	c4, c7, c8	d1 – d6
10	Vitamins	24 - 26	a3	b1,b2,b3, b6	c7, c8	d1 – d6
11	Immunochemistry	27	a8	b1,b2,b3, b6	c7, c8	d1 – d6
12	Biological membranes	28	a6	b1,b2,b3	-	d1 – d6
13	Hormones and basics of cellular signaling	28 -29	a4	b1,b2,b3, b4	c7, c8	d1 – d6
14	Basics of Molecular Biology	30 - 32	a5	b b1,b2,b3, b7 , b8	c7, c8	d1 – d6
15	Molecular cloning and other molecular biological techniques	33	a10	b1,b2,b3	c2, c7, c8	d1 – d6
16	Cell cycle, apoptosis and Carcinogenesis	34	-	b1,b2,b3, b7	c7, c8	d1 – d6
17	Body fluids	35 - 36	a9	b1,b2,b3	c6, c7, c8	d1 – d6



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## Course specification



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## Course specification of postgraduate

### 1-Basic information

<b>Course Code:</b>	M-34
<b>Course title :</b>	Fundamentals of biochemistry
<b>Program title:</b>	Master degree In Veterinary Medical Sciences (biochemistry)
<b>Contact hours/ week</b>	4hr./week (2hr. lecture & 2hr. practical)
<b>Approval Date</b>	

### 2-Professional information

**Overall aims of course:**

**This course aims to:**

- 1- Ensure that the post graduates reserve comprehensive bases in biochemistry and molecular biology.
- 2- Provide post graduates with knowledge, skills and confidence to enable them to pursue a career in the field of biochemistry and molecular biology.
- 3- Provide post graduates the opportunity to develop research skills in biochemistry.

### 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

**By the end of this course the student should be able to:**

- a1- Understand the biochemical structure and metabolism of various food stuffs.
- a2- Identify factors affecting enzyme activity and the uses of enzymes in clinical diagnosis.
- a3- Describe the biochemical structure of vitamins and their deficiency diseases.
- a4- Identify role of various hormones, growth factors and neurotransmitters in cell signaling.
- a5- Understand main processes of gene expression and their regulation.
- a6- Identify chemical structure of biological membranes and mechanism of transport of molecules across them.
- a7- Comprehend the process of cell cycle and its relation to carcinogenesis.
- a8- Understand the basics of cellular and humoral immunity.
- a9- Understand the biochemical composition of body fluids.
- a10- Describe the principles and steps of various molecular biological techniques.

**b-Intellectual skills**

**By the end of this course the student should be able to:**

- b1. Compare between biosynthesis and breakdown of various macromolecules.
- b2. Differentiate between functional and nonfunctional enzymes of blood plasma and their usefulness in biochemical diagnosis of the diseases.
- b3. Distinguish between each pairs of the following: water soluble and fat soluble vitamins, various types of immunoglobulins, macrominerals and microminerals and phase I and phase II of metabolism of xenobiotics.
- b4. Correlate the DNA replication and molecular biological techniques
- b5. Deal with their own research data and develop new approach to solving their research questions



## Course specification of postgraduate

b6. Interpret creative approaches to solving technical problems or issues associate with running and researches project.

b7. Identify, summarize and evaluate prior research findings in a specific area

### **C- Professional and practical skills**

**By the end of this course the student should be able to:**

c1. Employ the different biochemical methods of analysis for evaluation of abnormalities of metabolism of macro- and micromolecules.

c2. Practice on PCR technique.

c3. Perform biochemical analysis of lipid profiles in blood samples.

c4. Practice on different biochemical methods of analysis of various blood enzymes.

c5. Write a biochemical report about various electrolytes in blood plasma.

c6. Perform biochemical analysis of urine, semen and CSF.

c7. Manage laboratory results and correlate them to various diseases.

c8. Use statistical techniques in analyzing data.

### **d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

d1. Summarize research findings in oral presentations and workshops.

d2. Communicate effectively with supervisors.

d3. Demonstrate information retrieval and library skills.

d4. Be kind with experimental animals during experimentation.

d5. Encourage graduates for cooperation with colleagues.

d6. Improve computer and internet search skills.

## 4-Topics and contents

Course	Topic	No. of hours	Lectures	Practical
Fundamentals of biochemistry (Lec. 2h./week, Pract 2h./week)	Introduction to biochemistry	4	2	2
	Chemistry and metabolism of carbohydrates	16	8	8
	Chemistry and metabolism of lipids	16	8	8
	Chemistry and metabolism of amino acids and protein	16	8	8
	Chemistry and metabolism of purine and pyrimidine nucleotides	12	6	6
	Metabolism of heme and hemoglobin metabolism	12	6	6
	Metabolism of mineral	8	4	4
	Metabolism of xenobiotics	2	1	1
	Enzymes	8	4	4
	Vitamins	8	4	4



## Course specification of postgraduate

Immunochemistry	4	2	2
Biological membranes	4	2	2
Hormones and basics of cellular signaling	8	4	4
Basics of Molecular Biology	10	5	5
Molecular biological techniques	4	2	2
Cell cycle biochemistry	4	2	2
Body fluids	8	4	4
Total	144	72	72

### 5-Teaching and learning methods

5.1- Lectures (discussion) using board, data shows.

5.2- Self learning by preparing essays and presentations (computer researches and library)

5.3- Practical (models, samples and Practical classes: in which the demonstrators help the students to perform the laboratory tests by themselves).

### 7-Student assessment

#### 7.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	LS	P&P.S	G.S
written Exam	a1 – a10	b1 – b4	C1	d6
Practical Exam	a1,a2, a9,a10	b2,b3,b4	c1 – c8	d4
Oral Exam	a1 – a10	b1 – b5	c1 – c8	d1 ,d3,d6

#### 7.2. Assessment schedules

Method	Week(s)
Practical exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
written exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
Oral exam	During 45 <sup>th</sup> week -48 <sup>th</sup> week

#### 7.3. Weight of assessments

Assessment	Weight of assessment
Practical exams	25%
written exams	50%
Oral exam	25%
Total	100%



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## **Course specification of postgraduate**

### **8- List of references**

#### **8.1. Notes and books**

-Note book of biochemistry part I&II by staff members of biochemistry department.

#### **8.2. Essential books:**

1-Robert Murray, Victor Rodwell, David Bender, Kathleen M. Botham, P. Anthony Weil, Peter J. Kennelly. Harper's Illustrated Biochemistry, 28th Edition, 2009 (www.google.com).

2- Richard Harvey, Denise Ferrier. Lippincott's Illustrated Reviews: Biochemistry. 5 th Edition. 2010 (www.medicospace.com).

#### **8.3. Recommended texts**

1-David L. Nelson, Michael M. Cox. Lehninger Principles of Biochemistry. 4 th Edition. 2004.

2- Donald Voet , Judith G. Voet . Biochemistry. 4 th Edition. 2010.

#### **8.4. Journals, Websites .....etc**

##### **Journals:**

1- Egyptian J. of Biochemistry and molecular biology. Cairo, Egypt.

2- Biochemical journal.

3- Journal of biochemistry and molecular biology.

##### **Websites:**

WWW.Science direct

WWW. Pubmed.com

WWW.Scholar google.com

WWW.welly interscience

**Course coordinator**

**Dr. Eman Taha Mohamed**

**Head of Department**

**Prof.Dr.Mohamed Ahmed Kandeil**





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## Course specification of postgraduate

**Course Matrix for Achievement of Intended Learning Outcomes**

Topics		Wk	Knowledge and Understanding	Intellectual Skills	Practical and Professional Skills	General & Transferable Skills
1	Introduction to biochemistry	1	a1	b1	c1, c7, c8	d1 ,d3, d6
2	Chemistry and metabolism of carbohydrates	2- 5	a1-a4,a6	b1	c1, c7, c8	d1 ,d3, d6
3	Chemistry and metabolism of lipids	6 - 9	a1-a4,a6	b1	c1,c3, c7, c8	d1 ,d3, d6
4	Chemistry and metabolism amino acids and protein	10 - 13	a1-a4,a6	b1	c1, c7, c8	,d1,d3,d6
5	Chemistry and metabolism of purine and pyrimidine nucleotides	14 - 16	a1-a4, a6	b1	c1, c7, c8	d1 ,d3, d6
6	Metabolism of heme and hemoglobin metabolism	17 - 19	a1-a4, a6	b1	c1, c7, c8	d1 ,d3, d6
7	Metabolism of mineral	20 - 21	a9	b3	c1,c5, c7, c8	d1, d3, d6
8	Metabolism of xenobiotics	22	a6	b3	C1, c7, c8	d1 ,d3, d6
9	Enzymes	22 - 24	a2,a9	b2	C1,c4, c7, c8	d1 ,d3, d6
10	Vitamins	24 - 26	a3	b3	c1,c7, c8	d1 –d3, d6
11	Immunochemistry	27	a8	b3	C1,c7, c8	d1 ,d3, d6
12	Biological membranes	28	a6	b7	C1,c7,c8	d1 ,d3, d6
13	Hormones and basics of cellular signaling	28 -29	a4	b2	c7, c8	d1, d3, d6
14	Basics of Molecular Biology	30 - 32	a5,a10	b4	C2, c7, c8	d1, d3, d6
15	Molecular biological techniques	33	a5,a10	b4	c2, c7, c8	d1 ,d3, d6
16	Cell cycle biochemistry	34	a7	b4	C1,c7, c8	d1,d3, d6
17	Body fluids	35 - 36	a9	b2	C1, c7, c8	d1,d3, d6



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## Course specification



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## Course specification of postgraduate

### 1-Basic information

<b>Course Code:</b>	M-35
<b>Course title :</b>	Metabolism
<b>Program title:</b>	Master Degree of Veterinary Medical Sciences (Biochemistry).
<b>Contact hours/ week</b>	3 hours (1hr lecture & 2hr practical)/week
<b>Approval Date</b>	

### 2-Professional information

**Overall aims of course:**

**This course aims to:**

- 1-Ensure that students reserve comprehensive biochemical bases in Metabolism.
- 2-Provide students with different skills to enable them to pursue a career in the field of modern laboratory technology.

### 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

**By the end of this course the student should be able to:**

- a1-Understand the steps and reactions of carbohydrates, lipids, protein and (major and trace) elements metabolism.
- a2-Recognize the structure and function of different metabolites.
- a3-Understand the energetic and hormonal control of metabolism.
- a4-Comprehend the different types of energy and metabolic balance.
- a5-Describe the metabolic disturbances and the enzymatic defects.
- a6-Realize the inhibitors affecting metabolic pathways.
- a7- Understand the functioning of relation between different metabolic pathways in order to apply knowledge about metabolic disorders

**b-Intellectual skills**

**By the end of this course the student should be able to:**

- b1**-Correlate the enzymes that control the different metabolic pathways
- b2**-Compare between energy production results from different types of diet.
- b3**-Compare between direct and indirect calorimetry in measuring BMR (basal metabolic rate).

**C- Professional and practical skills**

**By the end of this course the student should be able to:**

- c1**-Practice on examination of different body fluid samples for diagnosis of metabolic disturbances.
- c2**-Use the experimental animals as models for studying the metabolic disorders.
- c3**-Use of statistical techniques for analysis of data.

**d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

- d1**-Summarize research review in oral form in seminars.
- d2**-Communicate effectively with supervisors.



## Course specification of postgraduate

- d3**-Demonstrate information retrieval and library skills.
- d4**-Experimental ethics with animals.
- d5**-Cooperation with other colleagues.
- d6**-interact with computer and internet search for thesis.

### 4-Topics and contents

Course	Topic	No. of hours	Lectures	Practical
metabolism (1hr lecture & 2hr practical)/week	Metabolism of different types of carbohydrates, Glycolysis, Krebs cycle, HMPP.	30	10	20
	Sources of ammonia, Urea cycle and Special pathways of Amino Acids metabolism.	21	7	14
	-Lipid metabolism, B-Oxidation, Fatty acid synthesis, Cholesterol metabolism.	21	7	14
	Major and trace elements metabolism.	21	7	14
	Intermediary metabolism	15	5	10
	<b>Total</b>		<b>108</b>	<b>36</b>

### 5-Teaching and learning methods

- 5.1- Lectures (discussion) using board, data shows
- 5.2- Active learning by preparing essays and presentations (computer researches and faculty library)
- 5.3- Practical courses

### 7-Student assessment

#### 7.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
written Exam	a1,a2, a3, a4,a5,a6,a7	b1,b2		d3
Practical Exam	a2,a5	b3	C1,c2	d4
Oral Exam	a1,a3, a4,a5,a6a7	b1,b2,b3		d1,d3,d6



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## Course specification of postgraduate

### 7.2. Assessment schedules

Method	Week(s)
Practical exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
written exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
Oral Exam	During 45 <sup>th</sup> week -48 <sup>th</sup> week

### 7.3. Weight of assessments

Assessment	Weight of assessment
Practical exams	25%
written exams	50%
Oral Exam	25%
total	100%

## 8- List of references

### 8.1. Notes and books

Course notes: Student handbook of Biochemistry part II prepared by the department staff members

### 8.2. Essential books:

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

### 8.3. Recommended texts

-Lippincott's Reviews of Biochemistry, 4th edition by Champe PC, Harvey RA, Ferrier DR, Lippincott William & Wilkins London, 2008.

### 8.4. Journals, Websites .....etc

#### Journals:

- Diabetes, obesity & metabolism.
- Nutrition, metabolism and cardiovascular diseases.
- Journal of bone and mineral metabolism.
- Biochemical medicine and metabolic biology.

#### Websites:

- <http://www.elsevier.com/located/clinbiochem>.
- <http://www.ncbi.nlm.nih.gov/pmc/journals/548>.
- <http://link.springer.com/journal/12291>

**Course Coordinators**  
**Prof.Dr.Mohamed Ahmed Kandeil,**  
**Dr. Ghada M. Safwat,**  
**Dr. Eman Taha Mohamed**

**Head of Department**  
**Prof.Dr.Mohamed Ahmed Kandeil**



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## Course specification of postgraduate

Course Matrix for Achievement of Intended Learning Outcomes

Topics		Wk	Knowledge and Understanding	Intellectual Skills	Practical and Professional Skills	General & Transferable Skills
1	Metabolism of different types of carbohydrates, Glycolysis, Krebs cycle, HMPP.	1-10	a1-a7	b1 –b2	C1, c2	d1 ,d3,d6
2	Sources of ammonia, Urea cycle and Special pathways of Amino Acids metabolism.	11- 17	a1-a7	b1 –b2	C1, c2	d1 ,d3,d6
3	-Lipid metabolism, B-Oxidation, Fatty acid synthesis, Cholesterol metabolism.	18-24	a1-a7	b1 –b2	C1, c2	d1 ,d3,d6
4	Major and trace elements metabolism.	25-31	a1-a7	b1 –b2	c1, c2	d1 ,d3,d6
5	Intermediary metabolism	32 - 36	a1-a7	b1 –b2	c1, c2	d1 ,d3,d6



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## Course specification

	Topics	week	Intended learning outcomes of course (ILOs)			
	1 <sup>st</sup> semester		K and U (a)	I.S (b)	P. P.S. (c)	G.T.S (d)
1						
2						
3						
4						
5						
6						
7						
8						
9						
	2 <sup>nd</sup> semester					
10						
11						
12						
13						
14						
15						
16						
17						
18						





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## Course specification of postgraduate

### 1-Basic information

<b>Course Code:</b>	M-36
<b>Course title :</b>	Biochemistry of tissues and body fluids
<b>Program title:</b>	Master degree In Veterinary Medical Sciences (biochemistry)
<b>Contact hours/ week</b>	4 h/week (2 h lecture& 2 h Practical)
<b>Approval Date</b>	

### 2-Professional information

**Overall aims of course:**

**This course aims to:**

- 2-Provide students with knowledge, skills, experiences and assurance to qualify for employment in medical laboratories.
- 3-Provide students with information and skills in calculations and interpretation of data.

### 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

**By the end of this course the student should be able to:**

- a1-Understand the general and specific functions of blood and tissues.
- a2**-Describe the biochemical function of different organs and tissues (Liver, kidney, heart, brain, muscles, adipose tissue)
- a3**-Describe the metabolic and functional disturbances in each tissues.
- a4- Illustrate the suitable biochemical analytical technique for evaluation of various disorders of tissue and body fluids.

**b-Intellectual skills**

**By the end of this course the student should be able to:**

- b1- Deal with ethical and professional issues of lab animals, handling, excision and homogenization of different tissues .
- b2- Interpret any diagnostic tests related to function of body organs.
- b3- Utilize the body fluids and tissue homogenates for biochemical markers and analysis related to different diseases in corresponding organ.
- b4. Adapt to evaluate their own research data and develop new approach to solving their research questions

**C- Professional and practical skills**

**By the end of this course the student should be able to:**

- c1**- Practice on collection of urine and blood samples from different laboratory animals.
- c2**- Use suitable biochemical analytical methods for estimation of serum levels of glucose, total proteins, albumin, cholesterol, creatinine and uric acid by colorimetric methods.
- c3**-Write a report about the clinical biochemical tests results.
- C4. Use the laboratory equipment safely and effectively.



## Course specification of postgraduate

### d- General and transferable skills

**By the end of studying the course, the student should be able to:**

- d1-** Communicate clearly and effectively with other colleagues ,
- d2-** Use, calculation & statistical methods as well as information technology tools.
- d3-** Be kind with animals during experimentation and scarification.
- d4-** To summarize research findings in oral form in seminars and workshops.
- d5-** To communicate effectively with supervisors.
- d6-** To demonstrate information hold and library skills.

### 4-Topics and contents

Course	Topic	No. of hours	Lectures	Practical
<b>Biochemistry of tissues and body fluids</b> (Lec. 2h./week, Pract 2h./week)	Biochemical structure and function of cell membrane.	24	12	12
	Biochemistry of Muscle structure and function	20	10	10
	Biochemistry of connective tissue, bone and adipose tissue	28	14	14
	Biochemistry of the kidneys function and its role in urine formation	24	12	12
	Plasma lipoproteins: composition, structure and biochemistry.	20	10	10
	Biochemical disorders results from kidney diseases and failure	28	14	14
	<b>Total</b>		<b>144</b>	<b>72</b>

### 5-Teaching and learning methods

- 5.1- Lectures (brain storm, discussion) using board, data shows
- 5.2- Self learning by preparing essays and presentations (computer researches and faculty library)
- 5.3- Practical and small group sessions.

### 7-Student assessment

#### 7.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
written Exam	<b>a1 – a4</b>	<b>b2</b>		d6,
Practical Exam	<b>a3, a4</b>	b1, b3, b4	<b>c1, c2 ,c3, c4</b>	d1, d4
Oral Exam	<b>a1 – a4</b>	<b>b2</b>		d1, d5, d6



## Course specification of postgraduate

### 7.2. Assessment schedules

Method	Week(s)
Practical exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
written exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
Oral Exam	During 45 <sup>th</sup> week -48 <sup>th</sup> week

### 7.3. Weight of assessments

Assessment	Weight of assessment
Practical exams	25%
written exams	50%
Oral Exam	25%
total	100%

## 8- List of references

### 8.1. Notes and books

Student handbook of biochemistry part I &II prepared by the department staff members.

### 8.2. Essential books:

-Harper's Illustrated Biochemistry 2003. 26 ed. **Robert K. Murray**, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell. Lange Medical Books/McGraw-Hill.

-BIOCHEMISTRY OF LIPIDS, LIPOPROTEINS AND MEMBRANES

-New Comprehensive Biochemistry, 1996, V. 31 DENNIS E. VANCE and JEAN E. VANCE, Elsevier Science B.V. Sara - Essential Physiological Biochemistry An organ-based approach. Stephen Reed, 2009 John Wiley & Sons, Ltd

### 8.3. Recommended texts

-Jiro Jerry Kaneko, John W. Harvey, Michael L. Bruss. Clinical - Essential Physiological Biochemistry An organ-based approach. Stephen Reed, 2009 John Wiley & Sons, Ltd

-Biochemistry of Domestic Animals. 6th Edition. 2008.

### 8.4. Journals, Websites .....etc

#### Journals:

- BMC Biochemistry
- Biochemical Medicine and Metabolic Biology
- Biochemical Systematics and Ecology

#### Websites:

- <http://www.elsevier.com/located/clinbiochem>.
- <http://www.ncbi.nlm.nih.gov/pmc/journals/548>.
- <http://link.springer.com/journal/12291>



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## **Course specification of postgraduate**

**Course Coordinators**

**Head of Department**

**Prof.Dr.Mohamed Ahmed Kandeil**

**Prof.Dr.Mohamed Ahmed Kandeil**



## Course specification

Course Matrix for Achievement of Intended Learning Outcomes

Topics	Wk	Knowledge and Understanding	Intellectual Skills	Practical and Professional Skills	General & Transferable Skills
1 Biochemical structure and function of cell membrane	1-6	a1-a4	b1 –b3		d4,d6,
2 Plasma lipoproteins: composition, structure and biochemistry	7- 13	a1-a4	b1 –b3	C1	d4,d6,d3
3 Kidney metabolism and diabetic nephropathy	14 - 18	a1-a4	b1 ,b2, b3	c1, c2	d3, d4, d6
4 Biochemistry of Muscle structure and function	19 - 23	a1-a4	b1, b2 ,b3	c1, c2	d3,d4,d6
5 Biochemistry of connective tissue: bone and adipose	24 - 30	a1-a4	b1 –b3	c1, c2	d3,d4,d6
6 Biochemistry of the kidneys	31 - 36	a1-a4	b1 –b3	c1, c2	d1,d2,d4, d6



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## Course specification of postgraduate

### 1-Basic information

<b>Course Code:</b>	M-37
<b>Course title :</b>	Biochemistry of hormones and reproduction
<b>Program title:</b>	Master degree in Vet. Med. Science (Biochemistry)
<b>Contact hours/ week</b>	2 hours/week (1hr lecture &1hr practical)
<b>Approval Date</b>	

### 2-Professional information

**Overall aims of course:**

**This course aims to:**

- Provide graduates with skills to make biochemical diagnosis of reproduction problems results from hormonal dysfunction.

### 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

**By the end of this course the student should be able to:**

- a1- Understand the biochemical structures and classification of hormones.
- a2-Recognize the biochemical function of hormones and its role in regulation of metabolism.
- a3-Describe the biochemical mode of action of hormones.

**b-Intellectual skills**

**By the end of this course the student should be able to:**

- b1- Deal with research papers in biochemistry of hormones.
- b2- Differentiate between biochemical dysfunction of different hormones
- b3- Interpret correctly the biochemical analytical data of hormones levels in different biological samples.

**C- Professional and practical skills**

**By the end of this course the student should be able to:**

- C1. Perform the biochemical analysis of hormones of different samples.
- C2. Practice on biochemical evaluation of composition of semen.
- C3. Write efficiently the laboratory professional reports about hormonal analysis.

**d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

- d1. Utilize different available resources for efficient obtaining of knowledge and Information.
- d2. Insure effective communication.





## Course specification of postgraduate

### 4-Topics and contents

Course	Topic	No. of hours	Lectures	Practical
<b>Biochemistry of hormones and reproduction</b> (Lec. 2 h./week, Pract. 2 h./week)	1. Biochemical structure of hormones.	20	10	10
	2. Biochemical classification of hormones.	8	4	4
	3. Mode of action of hormones.	8	4	4
	4. Role of different hormones in regulation of metabolism.	20	10	10
	5. Biochemical diagnosis of pituitary dysfunction.	16	8	8
	6. Biochemical diagnosis of thyroid dysfunction.	8	4	4
	7. Biochemical diagnosis of pancreas dysfunction.	16	8	8
	8. Biochemical diagnosis of Adrenal cortex dysfunction.	8	4	4
	9. Biochemical diagnosis of Adrenal medulla dysfunction.	16	8	8
	10. Biochemical diagnosis of gonads dysfunction.	16	8	8
	11. Biochemical constituent of semen.	8	4	4
	<b>Total</b>		<b>144</b>	<b>72</b>

### 5-Teaching and learning methods

- 5.1- Lectures (brain storm, discussion) using board, data shows
- 5.2- Self learning by preparing essays and presentations (computer researches and faculty library)
- 5.3- Practical (laboratory analysis of blood and semen samples).

### 7-Student assessment

#### 7.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	IS	P&P.S	G.S
Written Exam	a1,a2, a3	b1-b3		d1
Practical Exam	a1,a2,a3	b2- b3	c1,c2, c3	
Oral Exam	a1,a2,a3	b1-b3		d2

#### 7.2. Assessment schedules

Method	Week(s)
Practical exams	During 45 th week -48 th week
Written exams	During 45 th week -48 th week
Oral Exam	During 45 th week -48 th week



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## Course specification of postgraduate

### 7.3. Weight of assessments

Assessment	Weight of assessment
Practical exams	15%
Written exams	25%
Oral Exam	10%
total	50%

## 8- List of references

### 8.1. Notes and books

-Note book of biochemistry part II by staff members of biochemistry department.

### 8.2. Essential books:

-**Devlin, T. M. (1993)**: Textbook of Biochemistry: With Clinical Correlation. 3rd ed. (4th printing). Wiley-Liss: A John Wiley & Sons, Inc., Publication, 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, Connecticut, Loss Anglos, California.

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

### 8.3. Recommended texts

-Lippincott's Reviews of Biochemistry, 4th edition by Champe PC, Harvey RA, Ferrier DR, Lippincott William & Wilkins London, 2008.

### 8.4. Journals, Websites .....etc

#### Journals:

-Journal of Biochemistry

-Hormone and metabolic research.

-Hormones.

#### Websites:

-www.sciencedirect.com

-www.pubmed.com

**Course Coordinators**  
**Prof.Dr.Mohamed Ahmed Kandeil**

**Head of Department**  
**Prof.Dr.Mohamed Ahmed Kandeil**



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## Course specification of postgraduate

### Course Matrix for Achievement of Intended Learning Outcomes

Topics		Wk	Knowledge and Understanding	Intellectual Skills	Practical and Professional Skills	General & Transferable Skills
1	Biochemical structure of hormones.	1-2	a1	b1	C1-c3	d1
2	Biochemical classification of hormones.	3- 7	a1	b1	C1-c3	d1
3	Mode of action of hormones.	8 - 11	a3	b1	C1- c3	d1
4	Role of different hormones in regulation of metabolism.	12 - 14	a2	b1	C1- c3	d1
5	Biochemical diagnosis of pituitary dysfunction.	15 - 18	a2	b2 –b3	C1- c3	d1
6	Biochemical diagnosis of thyroid dysfunction.	19 - 20	a2	b2 –b3	C1- c3	d1
7	Biochemical diagnosis of pancreas dysfunction.	21 - 23	a2	b2 –b3	C1- c3	d1
8	Biochemical diagnosis of Adrenal cortex dysfunction.	24 - 26	a2	b2 –b3	C1- c3	d1
9	Biochemical diagnosis of Adrenal medulla dysfunction.	27 - 30	a2	b2 –b3	C1 –c3	d1
10	Biochemical diagnosis of gonads dysfunction.	31 - 33	a2	b2 –b3	C1 –c3	d1
11	Biochemical constituent of semen.	34- 36	a2	b2 –b3	C2, c3	d1



Beni Suef University  
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## Course specification

	Topics	week	Intended learning outcomes of course (ILOs)			
	1 <sup>st</sup> semester		K and U (a)	I.S (b)	P. P.S. (c)	G.T.S (d)
1						
2						
3						
4						
5						
6						
7						
8						
9						
	2 <sup>nd</sup> semester					
10						
11						
12						
13						
14						
15						
16						
17						
18						



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Faculty of Veterinary Medicine



## Course specification of postgraduate

### 1-Basic information

<b>Course Code:</b>	M-38
<b>Course title :</b>	Nutritional biochemistry
<b>Program title:</b>	<b>Master degree In Veterinary Medical Sciences (biochemistry)</b>
<b>Contact hours/ week</b>	4hr./week(2hr. lecture &2 hr.practicle)
<b>Approval Date</b>	

### 2-Professional information

**Overall aims of course:**

**This course aims to:**

Provide graduates the opportunity to correlate knowledge in the field of nutritional biochemistry with related knowledge in other fields.

### 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

**By the end of this course the student should be able to:**

- a1-Understand the biochemical role of nutrients and energy and nitrogen balance of the body.
- a2-Describe the structure and function of macro- and micronutrients.
- a3-Recognize factors affecting the bioavailability of nutrients.
- a4-Describe the different food sources of nutrients.
- a5-Understand metabolic disturbances resulting from micronutrient deficiency.
- a6-Describe the biochemical relation between nutrition and some diseases.

**b-Intellectual skills**

**By the end of this course the student should be able to:**

- b1- Correlate between healthy nutrition and growth rate of different animal species.
- b2-Differentiate between energy production of each type of macronutrient
- b3-Interpret the expected metabolic disorders and diseases resulting from nutrient deficiency or overfeeding

**C- Professional and practical skills**

**By the end of this course the student should be able to:**

- c1- Perform measuring of some minerals and vitamins content of body fluids
- c2- Obtain data bout the relation of some diseases and nutrients
- c3- Use the statistical techniques.

**d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

- d1. Create a research plan and put reasonable solution for the research problems.
- d2. Communicate effectively with supervisors.
- d3. Demonstrate information retrieval and library skills.
- d4. Summarize research review in oral form in seminars
- d5. Encourage graduates for cooperation with colleagues.



## Course specification of postgraduate

d6. Improve computer and internet search skills.

### 4-Topics and contents

Course	Topic	No. of hours	Lectures	Practical
Nutritional biochemistry (Lec. 2h./week, Pract 2h./week)	Biochemical basis for nutrient requirements	8	4	4
	Absorption and transport of nutrients (carbohydrates, lipids ,proteins, vitamins and minerals)	20	10	10
	Food sources of nutrients and factors affecting nutrient bioavailability	16	8	8
	Biochemical structure and metabolic functions of macro-and micronutrient (vitamins and minerals)	30	15	15
	Biochemical basis for nutrient requirements	16	8	8
	Relation between nutrition and disease like obesity	18	9	9
	Relation between nutrition and fatty liver disease	18	9	9
	Relation between nutrition and metabolic syndrome.	18	9	9
	<b>Total</b>		<b>144</b>	<b>72</b>

### 5-Teaching and learning methods

- 5.1- Lectures (brain storm, discussion) using board, data shows
- 5.2- Self learning by preparing essays and presentations (computer researches and faculty library)
- 5.3- Practical (models, samples, classes: in which the demonstrators help the students to perform the laboratory tests by themselves).

### 7-Student assessment

#### 7.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
written Exam	a1 – a6	b1 – b3	C2	d1 ,d3,d4
Practical Exam	a2	b3	c1 , c3	d5
Oral Exam	a1 – a6	b1 – b3	c1 , c2	d1 ,d3,d4



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## Course specification of postgraduate

### 7.2. Assessment schedules

Method	Week(s)
Practical exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
written exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
Oral Exam	During 45 <sup>th</sup> week -48 <sup>th</sup> week

### 7.3. Weight of assessments

Assessment	Weight of assessment
Practical exams	25%
written exams	50%
Oral Exam	25%
total	100%

## 8- List of references

### 8.1. Notes and books

Note book of biochemistry part I& II by staff members of biochemistry department.

### 8.2. Essential books:

- 1- J.Wallach. Interpretation of diagnostic tests. Lippincott Williams & Wikins,2000.
- 2- F.Fischbach. A Manual of Laboratory & Diagnostic Tests. Lippincott, 2000.
- 5- Eugene C. Toy, Jr., William E Seifert , Henry W. Strobel, Konrad P. Harms. Case Files: Biochemistry. 1<sup>st</sup> Edition. 2005.

### 8.3. Recommended texts

- 1- Michael A. Lieberman , Allan Marks. Marks' Basic Medical Biochemistry: A Clinical Approach. 3<sup>rd</sup> Edition. 2008.
- 2- Thomas M. Devlin. Textbook of Biochemistry with Clinical Correlations. 6<sup>th</sup> Edition. 2005.

### 8.4. Journals, Websites .....etc

#### Journals:

- Egyptian J. of Biochemistry and molecular biology. Cairo, Egypt.
- Journal of clinical biochemistry and nutrition.
- Journal of nutritional biochemistry.

#### Websites:

- <http://www.elsevier.com/located/clinbiochem>.
- <http://www.ncbi.nlm.nih.gov/pmc/journals/548>.
- <http://link.springer.com/journal/12291>.

**Course Coordinators**  
**Dr. Ghada M. Safwat**

**Head of Department**  
**Prof.Dr.Mohamed Ahmed Kandeil**





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## Course specification of postgraduate

**Course Matrix for Achievement of Intended Learning Outcomes**

Topics		Wk	Knowledge and Understanding	Intellectual Skills	Practical and Professional Skills	General & Transferable Skills
1	Biochemical basis for nutrient requirements	1-2	a1,a2	b2		d1 ,d3,d4
2	Absorption and transport of nutrients	3- 6	a1	b3	C1	d1 ,d3,d4
3	Food sources of nutrients and factors affecting nutrient bioavailability	7 - 10	a3	b3		d1 ,d3,d4
4	Biochemical structure and metabolic functions of macro-and micronutrient (vitamins and minerals)	11 - 14	a2	b3	C1	d1 ,d3,d4
5	Biochemical basis for nutrient requirements	15 - 18	a1	b1	C 3	d1 ,d3,d4
6	Relation between nutrition and disease like obesity	19	a6	b3	C1	d1 ,d3,d4
7	Relation between nutrition and fatty liver disease	20	a6	b3	C1	d1 ,d3,d4
	Relation between nutrition and metabolic syndrome.	21	a6	b3	C1	d1 ,d3,d4



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## Course specification

	Topics	week	Intended learning outcomes of course (ILOs)			
	1 <sup>st</sup> semester		K and U (a)	I.S (b)	P. P.S. (c)	G.T.S (d)
1						
2						
3						
4						
5						
6						
7						
8						
9						
	2 <sup>nd</sup> semester					
10						
11						
12						
13						
14						
15						
16						
17						
18						



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## Course specification of postgraduate

### 1-Basic information

<b>Course Code:</b>	M-39
<b>Course title :</b>	Clinical Biochemistry
<b>Program title:</b>	Master degree in Vet. Med. Science (biochemistry)
<b>Contact hours/ week</b>	4hours/week (2hr lecture &2hr practical)
<b>Approval Date</b>	

### 2-Professional information

**Overall aims of course:**

**This course aims to:**

Enable graduate to achieve competency in modern laboratory techniques in biochemical analysis of blood and urine.

### 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

**By the end of this course the student should be able to:**

- a1- Understand specialized principles, theories and hypotheses in clinical biochemistry.
- a2-Recognize the clinical biochemical basis of metabolism.
- a3-Describe the metabolic disorders of carbohydrate, lipid and protein metabolism.
- a4-Comprehend the biochemical composition of blood and urine.

**b-Intellectual skills**

**By the end of this course the student should be able to:**

- b1- Interpret the differential diagnostic biochemical tests related to different organs.
- b2- Utilize clinical chemistry instrumentation and automation.

**C- Professional and practical skills**

**By the end of this course the student should be able to:**

- C1. Write efficiently the laboratory reports of biochemical analysis of blood and urine.
- C2. Perform relevant statistical analysis of obtained data.

**d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

- d1. Utilize the information technology in the development of laboratory professional practice.
- d2. Insure effective communication.
- d3. Own continuous and self-learning



## Course specification of postgraduate

### 4-Topics and contents

Course	Topic	No. of hours	Lectures	Practical
<b>Clinical biochemistry</b> 4 hours /week (Lec. 2h./week, pract. 2h./week)	<u>1. Metabolic disorders of carbohydrate metabolism</u>			
	Favisim	4	2	2
	Glycogen storage disease	4	2	2
	Diabetes mellitus	8	4	4
	<u>2. Metabolic disorders of lipid metabolism</u>			
	Hyperlipidemia	4	2	2
	Hypercholesterolemia	4	2	2
	Ketosis	4	2	2
	Fatty liver	16	8	8
	<u>3. Metabolic disorders of protein metabolism</u>			
	Hyperammonemia	8	4	4
	Phenylketonuria	4	2	2
	Maple syrup disease	4	2	2
	Albinism	4	2	2
	Alkaptonuria	4	2	2
	Porphyrias	8	4	4
	Disorder of bilirubin metabolism(Jaundice)	8	4	4
	Disorder of purine metabolism (Gout)	4	2	2
	4. Liver function tests	8	4	4
	5. Kidney function tests	8	4	4
6. Cardiac function tests	8	4	4	
7. Biochemistry of blood	16	8	8	
8. Urine analysis	16	8	8	
	<b>Total</b>	<b>144</b>	<b>72</b>	<b>72</b>

### 5-Teaching and learning methods

5.1- Lectures using board, data shows.

5.2- Self learning by preparing essays and presentations (computer researches and faculty library)

5.3- Practical and small group sessions (laboratory analysis of blood and urine samples).

### 7-Student assessment

#### 7.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
written Exam	a1,a2,a3,a4	b1		d3
Practical Exam	a4	b2	c1,c2	
Oral Exam	a1,a2,a3,a4	b1		d3



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## Course specification of postgraduate

### 7.2. Assessment schedules

Method	Week(s)
Practical exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
written exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
Oral Exam	During 45 <sup>th</sup> week -48 <sup>th</sup> week

### 7.3. Weight of assessments

Assessment	Weight of assessment
Practical exams	25%
written exams	50%
Oral Exam	25%
total	100%

## 8- List of references

### 8.1. Notes and books

-Note book of biochemistry part II by staff members of biochemistry department.

### 8.2. Essential books:

-**Devlin, T. M. (1993):** Textbook of Biochemistry: With Clinical Correlation. 3rd ed. (4th printing).

Wiley-Liss: A John Wiley & Sons, Inc., Publication, 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, Connecticut, Loss Anglos, California.

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

### 8.3. Recommended texts

-Lippincott's Reviews of Biochemistry, 4th edition by Champe PC, Harvey RA, Ferrier DR, Lippincott William & Wilkins London, 2008.

### 8.4. Journals, Websites .....etc

#### Journals:

-Clinical biochemistry journal.

-Journal of clinical biochemistry and nutrition.

-Indian journal of clinical biochemistry.

#### Websites:

-<http://www.elsevier.com/located/clinbiochem>.

-<http://www.ncbi.nlm.nih.gov/pmc/journals/548>.

-<http://link.springer.com/journal/12291>.

**Course Coordinators**  
**Dr. Ghada M. Safwat**

**Head of Department**  
**Prof.Dr.Mohamed Ahmed Kandeil**



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## Course specification of postgraduate

Topics		Wk	Knowledge and Understanding	Intellectual Skills	Practical and Professional Skills	General & Transferable Skills
1	Favisim and Glycogen storage disease	1-2	a1-a4	b1 –b2	c1-c2	d1 , d3
2	Diabetes mellitus	3- 4	a1-a4	b1 –b2	c1-c2	d1 , d3
3	Hyperlipidemia	5	a1-a4	b1 –b2	c1-c2	d1 , d3
4	Hypercholesterolemia	6	a1-a4	b1 –b2	c1-c2	d1 , d3
5	Ketosis	7	a1-a4	b1 –b2	c1-c2	d1 , d3
6	Fatty liver	8-11	a1-a4	b1 –b2	c1-c2	d1 , d3
7	Hyperammonemia	12- 13	a1-a4	b1 –b2	c1-c2	d1 , d3
8	Phenylketonuria	14	a1-a4	b1 –b2	c1-c2	d1 , d3
9	Maple syrup disease	15	a1-a4	b1 –b2	c1-c2	d1 , d3
10	Albinism	16	a1-a4	b1 –b2	c1-c2	d1 , d3
11	Alkaptonuria	17	a1-a4	b1 –b2	c1-c2	d1 , d3
12	Porphyrias	18-19	a1-a4	b1 –b2	c1-c2	d1 , d6
13	Disorder of bilirubin metabolism(Jaundice)	20-21	a1-a4	b1 –b2	c1-c2	d1 , d3
14	Disorder of purine metabolism (Gout)	22	a1-a4	b1 –b2	c1-c2	d1 , d3
15	Liver function tests	23-24	a1-a4	b1 –b2	c1-c2	d1 , d3
16	Kidney function testes	25-26	a1-a4	b1 –b2	c1-c2	d1 , d3
16	Cardiac function test	27-28	a1-a4	b1 –b2	c1-c2	d1 , d3
17	Biochemistry of blood	29-32	a1-a4	b1 –b2	c1-c2	d1 , d3
18	Urine analysis	33-36	a1-a4	b1 –b2	c1-c2	d1 , d3



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## Course specification

	Topics	week	Intended learning outcomes of course (ILOs)			
	1 <sup>st</sup> semester		K and U (a)	I.S (b)	P. P.S. (c)	G.T.S (d)
1						
2						
3						
4						
5						
6						
7						
8						
9						
	2 <sup>nd</sup> semester					
10						
11						
12						
13						
14						
15						
16						
17						
18						





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## Course specification of postgraduate

### 1-Basic information

<b>Course Code:</b>	M-40
<b>Course title :</b>	Avian biochemistry
<b>Program title:</b>	Master degree In Veterinary Medical Sciences (biochemistry)
<b>Contact hours/ week</b>	4 hours (2hr lecture & 2hr practical)
<b>Approval Date</b>	

### 2-Professional information

**Overall aims of course:**

**This course aims to:**

Provide graduates the opportunity to develop research skills in biochemistry laboratory finding of birds and rabbits and to diagnose the metabolic disorders.

### 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

**By the end of this course the student should be able to:**

- a1- Understand main features of avian biochemistry.
- a2- Recognize steps of carbohydrate, lipid and proteins metabolism in birds and rabbits
- a3- Comprehend the importance of certain minerals and vitamins for birds and rabbits metabolism.
- a4- Illustrate the biochemical effects of different stress factors on growth rate and healthiness of birds..
- a5- Describe the various disorders of avian metabolism.

**b-Intellectual skills**

**By the end of this course the student should be able to:**

- b1- Compare between metabolism in mammals and birds.
- b2- Correlate the biochemical importance of the metabolism and growth rates in birds and rabbits.
- b3. Utilize biochemical analytic methods in the differential diagnosis of birds and rabbit diseases.

**C- Professional and practical skills**

**By the end of this course the student should be able to:**

- c1- Practice on collection of blood and tissue samples from birds.
- c2- Perform biochemical analysis to evaluate metabolic disorders in birds and rabbits.
- c3- Manage the role of natural antioxidants in improving growth and reproduction of birds and rabbits.
- C4. Write a report about laboratory results and correlate them to disorders.
- C5. Use statistical techniques in analyzing data.



## Course specification of postgraduate

### d- General and transferable skills

**By the end of studying the course, the student should be able to:**

**d1**-Summarize research findings in oral form in seminars and workshops.

**d2**-Communicate effectively with supervisors.

**d3**-Demonstrate information hold and library skills.

**d4**-Encourage students for cooperation with colleagues.

### 4-Topics and contents

Course	Topic	No. of hours	Lectures	Practical
Avian biochemistry (Lec. 2h./week, Pract 2h./week)	Special features of avian biochemistry	24	12	12
	Carbohydrate, lipid and protein intermediary metabolism	28	14	14
	Biochemical role of certain minerals and natural antioxidants in birds and rabbit growth and reproduction	20	10	10
	Metabolic adaptation in avian species	20	10	10
	Avian hormones and the control of metabolism	28	14	14
	The avian genome and its expression.	24	12	12
	Total	144	72	72

### 5-Teaching and learning methods

5.1- Lectures (discussion) using board, data shows

5.2- Self learning by preparing essays and presentations (computer researches and faculty library)

5.3- Practical classes (in which the demonstrators help the students to perform the laboratory tests by themselves).

### 7-Student assessment

#### 7.1. Assessments methods:

Methods of assessments	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	LS	P&P.S	G.S
written Exam	a1 – a5	b1 , b2	C3, c4	d1,d3
Practical Exam		b3	c1 , c2, c5	
Oral Exam	a1 – a5	b1 , b2	C3, c4	d1,d3



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## Course specification of postgraduate

### 7.2. Assessment schedules

Method	Week(s)
Practical exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
written exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
Oral Exam	During 45 <sup>th</sup> week -48 <sup>th</sup> week

### 7.3. Weight of assessments

Assessment	Weight of assessment
Practical exams	25%
written exams	50%
Oral Exam	25%
total	100%

## 8- List of references

### 8.1. Notes and books

Note book of biochemistry part II by staff members of biochemistry department

### 8.2. Essential books:

- Harper's Illustrated Biochemistry 2003. 26 ed. **Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell.** Lange Medical Books/McGraw-Hill.
- Poultry production. Richard, E. Austic and Malden C. Nesheim. 1990. Lea and Febiger, 13<sup>th</sup> edition, Philadelphia and London.
- Jiro Jerry Kaneko, John W. Harvey, Michael L. Bruss. Clinical Biochemistry of Domestic Animals. 6th Edition. 2008

### 8.3. Recommended texts

- Avian biochemistry and molecular biology 1996. Stevens, Lewis. The Edinburgh Building, Cambridge CB2 2RU, UK

### 8.4. Journals, Websites .....etc

#### Journals:

- The journal of poultry science.
- Journal of avian biology
- International *Journal of Poultry Sciences*

#### Websites:

- <http://www.elsevier.com/located/clinbiochem>.
- <http://www.ncbi.nlm.nih.gov/pmc/journals/548>.
- <http://link.springer.com/journal/12291>

**Course Coordinators**  
**Dr. Khalid Shaban hashem**

**Head of Department**  
**Prof.Dr.Mohamed Ahmed Kandeil**



Beni-Suef University  
Faculty of Veterinary Medicine

## **Course specification of postgraduate**

### **Course Matrix for Achievement of Intended Learning Outcomes**

Topics		Wk	Knowledge and Understanding	Intellectual Skills	Practical and Professional Skills	General & Transferable Skills
1	Special features of avian biochemistry	1-6	a1		C4	d1 ,d3
2	Carbohydrate, lipid and protein intermediary metabolism	7- 13	a1-a5	b1, b2	C4	d1 ,d3
3	Biochemical role of certain minerals and natural antioxidants in birds and rabbit growth and reproduction	14 - 18	a1, a3, a4	b3	C4	d1 ,d3
4	Avian hormones and the control of metabolism	19-23	a1,a3,a4,a5	b1 ,b2	C4	d1 ,d3
5	Metabolic adaptation in avian species	24-30	a1, a4, a5	b1 ,b2	C4	d1 ,d3
6	The avian genome and its expression	31 - 36	a1, a4		C4	d1 ,d3



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## Course specification

	Topics	week	Intended learning outcomes of course (ILOs)			
	1 <sup>st</sup> semester		K and U (a)	I.S (b)	P. P.S. (c)	G.T.S (d)
1						
2						
3						
4						
5						
6						
7						
8						
9						
	2 <sup>nd</sup> semester					
10						
11						
12						
13						
14						
15						
16						
17						
18						



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## Course specification of postgraduate

### 1-Basic information

<b>Course Code:</b>	M-41
<b>Course title :</b>	Fish biochemistry
<b>Program title:</b>	Master degree In Veterinary Medical Sciences (biochemistry)
<b>Contact hours/ week</b>	4 hours (2hr lecture & 2hr practical)
<b>Approval Date</b>	

### 2-Professional information

**Overall aims of course:**

**This course aims to:**

Provide graduates the opportunity to develop research skills about biochemistry and metabolism of fish.

### 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

**By the end of this course the student should be able to:**

- a.1. Describe the biochemical structures of body fluids and tissues of fish.
- a.2. Recognize the different metabolic pathways in fish.
- a.3. Comprehend different metabolic disorders in fish.
- a.4. Describe the role of different stressors and free radicals on biochemical balance of fish.

**b-Intellectual skills**

**By the end of this course the student should be able to:**

- b1-Differentiate between metabolism in mammals and fish
- b2-Differentiate between biochemical metabolic disorders in fish
- b3- Interpret the biochemical effects of different natural antioxidants and growth promoters on growth rate and healthiness of fish.

**C- Professional and practical skills**

**By the end of this course the student should be able to:**

- c1. Manage the normal and abnormal metabolites of the nutrient in fish.
- c.2. Practice on biochemical analysis of blood and tissue of fish
- c.3. Perform biochemical diagnosis of fish metabolic disorders by using of advanced molecular techniques.
- c4-Use statistical techniques in analyzing data

**d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

- d1 -Communicate effectively with supervisors.
- d2- Collect scientific data from library and scientific websites.
- d3-Encourage students for cooperation with colleagues.

### 4-Topics and contents





## Course specification of postgraduate

Course	Topic	No. of hours	Lectures	Practical
Fish biochemistry (Lec. 2h./week, Pract 2h./week)	Special features of fish biochemistry	24	12	12
	Carbohydrate, lipid and proteins and intermediary metabolism	28	14	14
	Effect of stress factors on antioxidants and biochemical balance in fish	20	10	10
	Metabolic adaptation in fish species	20	10	10
	fish hormones and the control of metabolism	28	14	14
	The fish genome and its biochemical expression.	24	12	12
	<b>Total</b>		<b>144</b>	<b>72</b>

### 5-Teaching and learning methods

- 5.1- Lectures (discussion) using board, data shows
- 5.2- Self learning by preparing essays and presentations (computer researches and faculty library)
- 5.3- Practical (models, samples and Practical classes in which the demonstrators help the students to perform the laboratory tests by themselves.

### 7-Student assessment

#### 7.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
written Exam	a1 – a4	b1 – b3	C1	d2
Practical Exam	a1	b2,b3	C2, c3, c4	d3
Oral Exam	a1 – a4	b1 – b3	c1 – c5	d2

#### 7.2. Assessment schedules

Method	Week(s)
Practical exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
written exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
Oral Exam	During 45 <sup>th</sup> week -48 <sup>th</sup> week

#### 7.3. Weight of assessments

Assessment	Weight of assessment
Practical exams	25%



Beni-Suef University  
Faculty of Veterinary Medicine

## **Course specification of postgraduate**

written exams	50%
Oral Exam	25%
total	100%

### **8- List of references**

#### **8.1. Notes and books**

Note book of biochemistry part II by staff members of biochemistry department

#### **8.2. Essential books:**

-Harper's Illustrated Biochemistry 2003. 26 ed. **Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell. Lange Medical Books/McGraw-Hill.**

-Jiro Jerry Kaneko, John W. Harvey, Michael L. Bruss. Clinical Biochemistry of Domestic Animals. 6th Edition. 2008

#### **8.3. Recommended texts**

-Biochemistry and molecular biology of fishes ([www.sciencedirect.com](http://www.sciencedirect.com)).

#### **8.4. Journals, Websites .....etc**

##### **Journals:**

-Journal of fish biochemistry

-Journal of fish biochemistry and physiology

##### **Websites:**

-<http://www.elsevier.com/located/clinbiochem>.

-<http://www.ncbi.nlm.nih.gov/pmc/journals/548>.

-<http://link.springer.com/journal/12291>

**Course Coordinators**

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Faculty of Veterinary Medicine

### Course specification of postgraduate

Topics		Wk	Knowledge and Understanding	Intellectual Skills	Practical and Professional Skills	General & Transferable Skills
1	Special features of fish biochemistry	1-6	a1		c2	d2
2	Carbohydrate lipid proteins and intermediary metabolism	7-13	a4	b3	c2	d2
3	Effect of stress factors on antioxidants and biochemical balance in fish	14- 18	a2,a3	b1	c1, c2	d2
4	Metabolic adaptation in fish species	19-23	a2	b1	c1, c2	d2
5	fish hormones and the control of metabolism	24-30	a2,a3	b1	c1,c2	d2
6	The fish genome and its expression.	31-36	a1		c3	d2



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## Course specification

	Topics	week	Intended learning outcomes of course (ILOs)			
	1 <sup>st</sup> semester		K and U (a)	I.S (b)	P. P.S. (c)	G.T.S (d)
1						
2						
3						
4						
5						
6						
7						
8						
9						
	2 <sup>nd</sup> semester					
10						
11						
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Faculty of Veterinary Medicine



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## Course specification of postgraduate

### 1-Basic information

<b>Course Code:</b>	M-42
<b>Course title :</b>	Microbiological biochemistry
<b>Program title:</b>	Master degree In Veterinary Medical Sciences (biochemistry)
<b>Contact hours/ week</b>	4hr/week(2 hr. lecture & 2 hr. practical)
<b>Approval Date</b>	

### 2-Professional information

**Overall aims of course:**

**This course aims to:**

Provide graduates the opportunity to develop biochemical research skills about recent therapeutic approach represented by probiotic.

### 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

**By the end of this course the student should be able to:**

- a1-Understand the biochemical composition and metabolism of microorganisms.
- a2-Describe the biochemical difference between prokaryotic and eukaryotic
- a3-Comprehend the therapeutic use of microorganisms in veterinary field.
- a4-Recognize the different biochemical techniques of molecular biology.

**b-Intellectual skills**

**By the end of this course the student should be able to:**

- b1-Compare between metabolism in microorganisms and mammals.
- b2-Correlate the biochemical importance of the metabolism and the growth of microbes.
- b3. Utilize creative approaches to solving technical problems or issues associate with researches project.

**C- Professional and practical skills**

**By the end of this course the student should be able to:**

- C1-Obtain information about biotechnology.
- C2-Use experimental animals for biochemical evaluation of the effect of probiotic on metabolic disorders.
- C3. Interpret laboratory results and correlate them to disorders.
- C5. Use statistical techniques in analyzing data.

**d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

- d1-Summarize research findings in oral form in seminars and workshops.
- d2-Communicate effectively with supervisors.
- d3-Demonstrate information hold and library skills.



## Course specification of postgraduate

- d4-**Encourage students for cooperation with colleagues.  
**d5.** Improve computer and internet search skills.

### 4-Topics and contents

Course	Topic	No. of hours	Lectures	Practical
Microbiological biochemistry (Lec. h./week, Pract h./week)	Membrane composition of microorganisms and its growth	24	12	12
	The Biological Fixation of Nitrogen	20	10	10
	Evolution of different biosynthetic pathways in microorganisms	28	14	14
	Biosynthesis of Amino Acids Derived from Phosphoglyceric Acid and Pyruvic Acid	24	12	12
	ATP-Generating Processes: Respiration and Fermentation	20	10	10
	The Biosynthesis of Nucleotides	28	14	14
	Total	144	72	72

### 5-Teaching and learning methods

- 5.1- Lectures (discussion) using board, data shows  
5.2- Self learning by preparing essays and presentations (computer researches and faculty library)  
5.3- Practical classes (in which the demonstrators help the students to perform the laboratory tests by themselves).

### 7-Student assessment

#### 7.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
Written Exam	a1 – a4	b1 , b2	C1	d1,d3
Practical Exam	a4	b3	C2, c3, c5	
Oral Exam	a1 – a4	b3	c1	d1,d3

#### 7.2. Assessment schedules



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## Course specification of postgraduate

Method	Week(s)
Practical exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
written exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
Oral Exam	During 45 <sup>th</sup> week -48 <sup>th</sup> week

### 7.3. Weight of assessments

Assessment	Weight of assessment
Practical exams	15%
written exams	25%
Oral Exam	10%
total	50%

## 8- List of references

### 8.1. Notes and books

-Note book of biochemistry part II by staff members of biochemistry department

### 8.2. Essential books:

-Harper's Illustrated Biochemistry 2003. 26 ed. **Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell. Lange Medical Books/McGraw-Hill.**  
- Lubert Stryer , Jeremy M. Berg , John L. Tymoczko . Biochemistry. 5th Revised edition. 2002.

### 8.3. Recommended texts

-Microbial Biochemistry, Second Edition. Springer Dordrecht Heidelberg London New York  
-Biochemistry - Industrial Microbiology and Biotechnology The McGraw Hill Companies, 2002

### 8.4. Journals, Websites .....etc

#### Journals:

-Journal of Clinical Microbiology  
- Applied biochemistry and microbiology

#### Websites:

<http://www.elsevier.com/located/clinbiochem>.  
-<http://www.ncbi.nlm.nih.gov/pmc/journals/548>.  
-<http://link.springer.com/journal/12291>.

**Course Coordinators**  
**Prof.Dr.Mohamed Ahmed Kandeil**

**Head of Department**  
**Prof.Dr.Mohamed Ahmed Kandeil**





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### Course specification of postgraduate

Topics		Wk	Knowledge and Understanding	Intellectual Skills	Practical and Professional Skills	General & Transferable Skills
1	Membrane composition of microorganisms and its growth	1-6	a1	b2		d1, d3
2	The Biological Fixation of Nitrogen	7- 13	a1, a2	b1	C3	d1, d3
3	Evolution of different biosynthetic pathways in microorganisms.	14 - 18	a1, a2	b1	C2	d1, d3
4	Biosynthesis of Amino Acids Derived from Phosphoglyceric Acid and Pyruvic Acid	19 - 23	a1, a2	b2		d1, d3
5	ATP-Generating Processes: Respiration and Fermentation	24 - 30	a1, a2	b2	c3	d1, d3
6	The Biosynthesis of Nucleotides	31 - 36	a4	b3	C1	d1, d3



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## Course specification

	Topics	week	Intended learning outcomes of course (ILOs)			
	1 <sup>st</sup> semester		K and U (a)	I.S (b)	P. P.S. (c)	G.T.S (d)
1						
2						
3						
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5						
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8						
9						
	2 <sup>nd</sup> semester					
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## Course specification of postgraduate

### 1-Basic information

<b>Course Code:</b>	M-43
<b>Course title :</b>	Radioactive materials and biochemistry
<b>Program title:</b>	Master degree In Veterinary Medical Sciences (biochemistry)
<b>Contact hours/ week</b>	3hr/week(2 hr. lecture & 1 hr. practical)
<b>Approval Date</b>	

### 2-Professional information

**Overall aims of course:**

**This course aims to:**

- 1- Provide students a comprehensive base about the relation between the use of radioactive materials in the field of biochemistry.
- 2-provide students with skills and confidence to enable them to pursue a career in the field of radioactive biochemistry.

### 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

**By the end of this course the student should be able to:**

- a1- Describe radioactive isotopes and their biochemical use.
- a.2. Describe different types and sources of radiation.
- a.3. Recognize the biochemical effect of radiation.
- a.4. Understand principles of radioimmunoassay

**b-Intellectual skills**

**By the end of this course the student should be able to:**

- b.1. Differentiate between the useful and the dangerous biomedical effects of radioactive agents.
- b.2. Interpret the types of radiations on relation to their sources.

**C- Professional and practical skills**

**By the end of this course the student should be able to:**

- c1. Practice on the radioimmunoassay (RIA).
- c.2. Use the lab safety roles about dealing with the radioactive isotopes.

**d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

- d1. Summarize research findings in oral form in seminars and workshops.
- d2 Communicate effectively with supervisors.
- d3- Demonstrate information hold and library skills.



## Course specification of postgraduate

### 4-Topics and contents

Course	Topic	No. of hours	Lectures	Practical
Radioactive materials and biochemistry (Lec. 1h./week, Pract . 2h./week)	Radioactive isotopes and their biochemical uses.	30	10	20
	Different types and sources of radiation	21	7	14
	Biochemical effects of radiation	21	7	14
	Principles of radioimmunoassay (RIA).	21	7	14
	Biochemical detection of radioactive isotopes.	15	5	10
	Total		108	36

### 5-Teaching and learning methods

- 5.1- Lectures (discussion) using board, data shows
- 5.2- Self learning by preparing essays and presentations (computer researches and faculty library)
- 5.3- Practical and small group sessions.

### 7-Student assessment

#### 7.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
written Exam	a1-a4	b1,b2		
Practical Exam		b1,b2	c1,c2	
Oral Exam	a1-a4		c2	d1-d3

#### 7.2. Assessment schedules

Method	Week(s)
Practical exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
written exams	During 45 <sup>th</sup> week -48 <sup>th</sup> week
Oral Exam	During 45 <sup>th</sup> week -48 <sup>th</sup> week

#### 7.3. Weight of assessments

Assessment	Weight of assessment
Practical exams	15%
written exams	25%



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## **Course specification of postgraduate**

Oral Exam	10%
total	50%

### **8- List of references**

#### **8.1. Notes and books**

-Note book of biochemistry part II by staff members of biochemistry department.

#### **8.2. Essential books:**

-Harper's Illustrated Biochemistry 2003. 26 ed. **Robert K. Murray**, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell. Lange Medical Books/McGraw-Hill.

#### **8.3. Recommended texts**

Jiro Jerry Kaneko, John W. Harvey, Michael L. Bruss. Clinical - Essential Physiological Biochemistry An organ-based approach. Stephen Reed, 2009 John Wiley & Sons, Ltd

#### **8.4. Journals, Websites .....etc**

##### **Journals:**

-Journal of radiation research and applied science ([www.sciencedirect .com](http://www.sciencedirect.com))

##### **Websites:**

<http://www.elsevier.com/located/clinbiochem>.

-<http://www.ncbi.nlm.nih.gov/pmc/journals/548>.

-<http://link.springer.com/journal/12291>

**Course Coordinators**

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## **Course specification of postgraduate**

### **Course Matrix for Achievement of Intended Learning Outcomes**

<b>Topics</b>		<b>Wk</b>	<b>Knowledge and Understanding</b>	<b>Intellectual Skills</b>	<b>Practical and Professional Skills</b>	<b>General &amp; Transferable Skills</b>
1	Radioactive isotopes and their biochemical uses.	1-2	a1	b1		d1, d3
2	Different types and sources of radiation	3- 6	a2	b2		d1, d3
3	Biochemical effects of radiation	7 - 10	a3	b1		d1, d3
4	Principles of radioimmunoassay (RIA).	11 - 14	a4	b2	c1	d1, d3
5	Biochemical detection of radioactive isotopes.	15 - 17	a4	b2	C2	d1, d3



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## Course specification

	Topics	week	Intended learning outcomes of course (ILOs)			
	1 <sup>st</sup> semester		K and U (a)	I.S (b)	P. P.S. (c)	G.T.S (d)
1						
2						
3						
4						
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7						
8						
9						
	2 <sup>nd</sup> semester					
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