



University of Sadat City  
Faculty of Veterinary Medicine  
Dept. of Physiology  
(2014-2015)



## Radioisotopes and Their Biological Uses (630P)

### PHD COURSE SPECIFICATION

#### A. BASIC INFORMATION

<b>University:</b>	<b>University of Sadat City</b>
<b>Faculty:</b>	<b>Veterinary Medicine</b>
<b>Program on which the course is given:</b>	<b>PhD in Veterinary Medical Sciences (physiology)</b>
<b>Department offering the Course:</b>	<b>Physiology</b>
<b>Course code:</b>	<b>630P</b>
<b>Course title:</b>	<b>Radioisotopes and Their Biological Uses</b>
<b>Lecture (hr/week):</b>	<b>2</b>
<b>Practical (hr/week):</b>	<b>2</b>
<b>Course coordinator:</b>	<b>Prof. Dr. Said Ibrahim Fathalla</b>

## **B. PROFESSIONAL INFORMATION**

### **1) Overall aims of course**

Distinguish basic and advanced knowledge and skills of types of radiation and isotopes, the risk they are taking and the benefits that they will receive from it.

### **2) Intended learning outcomes of course (ILOs)**

#### **a) KNOWLEDGE AND UNDERSTANDING**

By the end of this course, the graduate should be able to:-

- a.1. Elucidate how much is too much radiation.
- a.2. Resemble any information about **radioisotope**
- a.3. Describe the danger of dental x rays
- a.4. Resemble the danger of mobile [cellular] phones and can they cause cancer of the face or brain
- a.5. Elucidate the different types of radioactive decay
- a.6. Elucidate the different types of natural radiation.
- a.7. Realize why are some isotopes radioactive and others are not.
- a.8. Elucidate methods are used to detect radiation.
- a.9. Elucidate some examples of applications of constructive uses of radioactive isotopes.
- a.10. Resemble the biological effects of exposure to radiation.
- a.11. Explain how do microwaves mechanism.
- a.12. Elucidate radiation sickness.
- a.13. Resemble what type of radiation is likely to be emitted from optical glass as used in cameras.
  - a.14. Describe how is radioactivity taken into the body.
  - a.15. Recognize with radiation dangers as in television & computer viewing.
- A.16. Realize the medical uses of radioactive isotopes.
- A.17. Describe the safe methods for disposal radioactive isotopes.

#### **b) INTELLECTUAL SKILLS**

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

- b.1. Asses Radioisotope overexposure problems,
- b.2. Correlate biological uses of radioactive agents

#### **c) PROFESSIONAL AND PRACTICAL SKILLS**

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

- c.1 Design Techniques for body fluids samples from different animal species.
- c.2. Estimate environment samples to radioisotope over-exposure problems

c.3. Analyze body physiological parameters related to radioisotope over exposure markers

c.4. Assay of phagocytic activity and plasma proteins due to isotopes

c.5. Estimate the effect of isotopes on blood parameters.

### **GENERAL AND TRANSFERABLE SKILL**

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

d.1. Predicate tasks and resources,

d.2. Search for new information and technologies,

d.3. Employ available presentation aids (e.g. Projectors or Data Show) to present clearly and effectively a scientific topic in a tutorial, a staff meeting or the yearly scientific day.

### **3) Topics and contents**

Topic	No. of hours		
	Lect.	Pract.	Total
How much is too much radiation.	6	-	6
Information about sources of isotopes	6	-	6
The danger of dental x rays.	6	-	6
The danger of mobile [cellular] phones and can they cause cancer of the face or brain.	7	-	7
The different types of radioactive decay.	6	-	6
The different types of natural radiation.	6	-	6
Why are some isotopes radioactive and others not.	7	-	7
Methods are used to detect radiation.	6	-	6
Examples of applications of constructive uses of radioactive isotopes.	6	-	6
The biological effects of exposure to radiation.	6	-	6
How do microwaves heat things?	6	-	6
Explain radiation sickness.	5	-	5
Identify the types of radiation is likely to be emitted from optical glass as used in cameras.	5	-	5
How is radioactivity taken into the body?	5	-	5
Radiation dangers are there in television & computer viewing.	5	-	5
Techniques for body fluids samples from different animal species.	-	20	20
Measure Body Physiological parameters related to radioisotope over exposure markers.	-	20	20
Phagocytic activity and plasma proteins due to isotopes.	-	20	20

Effect of isotopes on fish blood parameters.	-	28	28
<b>Total</b>	<b>88</b>	<b>88</b>	<b>176</b>

#### 4) Teaching and learning methods

- Lectures to gain knowledge and understanding skills.
- Practical sessions for the students to gain practical skills.
- Self-learning activities.
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#### e. Student assessment

##### a. METHODS:

- Ñ Written exam to assess knowledge, information and intellectual skills.
- Ñ Practical exam to assess professional and practical skills.
- Ñ Oral exam to assess knowledge and information and intellectual skills.
- Ñ Student activities for assessing knowledge and general and transferable skills.

##### b. MATRIX ALIGNMENT OF THE MEASURED ILOs/ ASSESSMENTS METHODS:

	<b>K.U (a)</b>	<b>I.S (b)</b>	<b>P.P.S (c)</b>	<b>G.S (d)</b>
Written exam	1-17			
Practical exam		1-2	1-2-3-4-5	
Oral exam	2-3-4-6-7-9-10-11-13-15-16	1-2		
Student activities				1-2-3

##### c. WEIGHT OF ASSESSMENTS:

<b>Assessment</b>	<b>Allocated Mark</b>	<b>Evidence</b>
Final written exam	<b>50%</b>	Marked and signed written paper
Practical exam	<b>20%</b>	Marked and signed practical exam paper
Oral exam	<b>20%</b>	Signed list of oral exam marks
Student activities	<b>10%</b>	Assay, presentations, discussions, review

#### f. List of references

##### 6.1. Essential textbooks

1-Berne, R.M. & Levy, M.N. (eds) 1996, *Principles of Physiology*, 2nd edition, Mosby, Sydney.

2- William O. Reece 2004, *Dukes' Physiology of Domestic Animals*, 12<sup>th</sup> edition, Cornell University Press

3- **Textbook of Medical Physiology (Guyton)2010**

4-**Text Book of Veterinary Physiology, Cunningham, Elsevier, 2007.**

5- **Keith B. 2013, Fish physiology**

### **6.3. Web sites**

- **J** Tropical animal health and production
- Journal of animal science
- J. of applied physiology
- J. of veterinary physiology
- ) \* J. of comparative biochemistry & physiolog

### **g. Facilities required for teaching and learning**

7.1 Data-show.

7.2 Laboratory animals for experimental physiology.

7.3 Network for technology transfer.

7.4 Laboratory kits for experimental physiology.

7.5 Computer.

	<b>Course coordinators</b>	<b>Head of department</b>
<b>Name</b>	Prof. Dr. Said Ibrahim Fathalla	Prof. Dr. Shaaban Gadallah
<b>Signature</b>		

### Matrix alignment of course topics and ILOs

Topic	No. of hours /week		Total hours	Hours for Pract.	ILOs			
	Lect.	Pract.			K.U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
How much is too much radiation.	2	-	6		1	1-2		2,3
Information about sources of isotopes	2	-	6		2	1-2		1,3
The danger of dental x rays.	2	--	6		3	1-2		1,2
The danger of mobile [cellular] phones and can they cause cancer of the face or brain.	2	-	7		4	1-2		1,3
The different types of radioactive decay.	2	-	6		5	1-2		1,2
The different types of natural radiation.	2	-	6		6	1-2		1,3
Why are some isotopes radioactive and others not.	2	-	7		7	1-2		1,2
Methods are used to detect radiation.	2	-	6		8	1-2		1,3
Examples of applications of constructive uses of radioactive isotopes.	2	-	6		9	1-2		1,2
The biological effects of exposure to radiation.	2	-	6		10-16- 17	1-2		1,2
How do microwaves heat things?	2	-	6		11	1-2		1,3
Explain radiation sickness.	2	-	5		12	1-2		1,3
Identify the types of radiation is likely to be emitted from optical glass as used in cameras.	2	-	5		13	1-2		1,2
How is radioactivity taken into the body?	2	-	5		14-16- 17	1-2		1,3

Topic	No. of hours /week		Total hours	Hours for Pract.	ILOs			
	Lect.	Pract.			K.U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
Radiation dangers are there in television & computer viewing.	2	-	5		15	1-2		1,2
Techniques for body fluids samples from different animal species.	-	2	-	20	-	1-2	1	1,2
Measure Body Physiological parameters related to radioisotope over exposure markers.	-	2	-	20	-	1-2	2-3	1,3
Phagocytic activity and plasma proteins due to isotopes.	-	2	-	20		1-2	4	1
Effect of isotopes on fish blood parameters.	-	2	-	28		1-2	5	3