Specification for Virology course
2019/2020

A-Affiliation

1.	**Relevant program**	Bachelor of Veterinary Medical Science (BVMSc)
2.	**Department offering the course**	Virology

Date of specification approval: ministerial decree No. 1727 on 26/4/2017
(Approved in this template by the department council on 1/10/2019**)**

B-Basic information

1.	**Course title**	Virology
2.	**Course code**	303 (A) I
3.	**Level**	3rd year
4.	**Semester**	First semester
5.	**Total hours**	4
6.	**Lecture hours**	2
7.	**Practical hours**	2

C-Professional Information

1- Course learning objectives

- Help the students to understand the fundamental characters of viruses.
- Provide the students with an over view on physical and chemical properties of viruses.
- Study the biological properties of the viruses in relation to virus Haemagglutination, virus replication in the cell, pathogenesis of viral infection and interference phenomena.
- Provide the students with the required knowledge about host immune response to viral infection.
- Provide the students with strategies to protect against and combat viral infection through vaccination.
- Studying the effect of some physical and chemical agents on viruses.
- Experimental description and application of techniques used for preparation and isolation of suspected viral samples

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

a- Knowledge and understanding

After successful completion of the course the students should be able to:

a.1- Mention the basics of the fundamental characters of viruses.
a.2- Describe the size, shape and Molecular weight of viruses.
a.3- Describe the chemical composition and chemical structure of viruses.

a.4- Define, classify and explain factors affecting Haemagglutination.
a.5- Explain the steps involved in virus replication at cellular level.
a.6- Identify the stages evolved and mechanism of pathogenesis of viral infection.
a.7- Describe the outcomes of infection of a single cell with two viruses.
a.8- Define and describe the types, biological character, mechanism of production and mode of action of interferon in addition to factors affecting their production.
a.9- Illustrate the cellular and humoral immune response to viral infection.
a.10- Identify the basics of viral vaccines.
a.11- Explain the effect of physical and chemical agents on viruses and their mechanism.
a.12- Mention General scheme for viral isolation & identification
a.13- Identify methods for virological laboratory safety

b- Intellectual skills

After successful completion of the course the students should be able to:

b.1- Distinguish viruses from other micro-organisms.
b.2- Evaluate the viral size, shape and molecular weight and use it in viral classification.
b.3- Analyze the chemical structure (nucleic acid, capsid, envelop) of viruses based on their chemical composition.
b.4- Compare between RNA and DNA viruses.
b.5- Interpret the haemagglutination properties of the viruses and their use in viral purification and concentration.
b.6- Correlate the steps of viral multiplication at cellular level with the cytopathic effect for different viruses.
b.7- Compare between different stages and mechanisms of viral pathogenesis.
b.8- Differentiate between interferon and antibody with an explanation to mode of action of interferon.
b.9- Link between the cellular and humoral immune response to viral infection.
b.10- Suggest methods for preparation of different viral vaccines.
b.11- Interpret the effect of some physical and chemical agents on viruses.
b.12- Choose the suitable method for preparation and preservation of suspected viral sample.
b.13- Choose the susceptible host system and route of inoculation during isolation of suspected viral sample

c- Professional and practical skills

After successful completion of the course the students should be able to gain the followings:

c.1- Skills during sampling:

c.1.1- Collect samples at right time, right site, right condition and complete right data.
c.1.2- Preserve suspected viral sample using suitable methods of preservation.

c.1.3- Prepare different forms of samples under complete aseptic conditions.

c.2- Skills during Lab. animal inoculation:

c.2.1- Investigate Lab. animals before and after inoculation with suspected viral samples.
c.2.2- Investigate Lab. animals with different routes of inoculation.
c.2.3- Collect different samples from Lab. animals for virological purposes.

c.3- Skills during fertile egg inoculation:

c.3.1- Examine and select suitable SPF fertile egg used for virus isolation.
c.3.2- Manipulate and inoculate fertile egg with different routes under complete aseptic conditions.
c.3.3- Harvest and examine fertile egg to detect signs of viral growth.

c.4- Skills during tissue culture inoculation:

c.4.1- Manipulate different equipments used in tissue culture room.
c.4.2- Prepare primary tissue culture under aseptic condition.
c.4.3- Identify different types of primary tissue culture & cell line.
c.4.4- Examine and detect the changes in tissue culture media.
c.4.5- Provide cells with its basic requirements for growth.
c.4.6- Prepare maintaince and growth media and dispersing solutions.
c.4.7- Subculture and preserve tissue culture for short and long period.
c.4.8- Inoculate tissue culture during confluency and in suspension.
c.4.9- Describe viral growth on tissue culture under inverted microscope

d- General and transferable skills

After successful completion of the course the students should have the following skills

d.1- Cooperate and work in a team
d.2- Searching skill.
d.3-Communication skill
d.4- Mural and culture of virologist
d.5- problem solving skill

3- Course contribution in the program ILOs:

Course ILOS		Program ILOS
A	**Knowledge and understanding**	a^{7}
B	**Intellectual skills**	$b^{6,7}$
C	**Professional and practical skills**	c^{13}
D	**General and transferable skills**	$d^{1,5,6}$

3.1- Course contents:

Topic	**Lecture hours**	**Practical hours**

(1)Introduction (2)Fundamental characters of viruses	2	
(3) General Properties of viruses A. Physical properties of viruses. B. Chemical properties of viruses.	2 4	
(4) Viral Haemagglutination	2	
(5) Virus cell relationships (virus multiplication)	6	
(6) Pathogenesis of viral infection	4	
(7) Interference phenomenona	2	
(8) Viral immunity	6	
(9) Viral vaccines		
(10) Effect of physical & chemical agents on viruses	2	
(1) General scheme for viral isolation & identification		2
(2) lab safety		2
(3) sampling • Collection • Preservation • preparation		6
(4) lab animal • advantage • disadvantage • route of inoculation • hyper immune serum • monoclonal antibodies		4
(5) fertile egg • advantage • disadvantage • specifications • structure • route of inoculation • harvestation • signs and factors affecting		8
(6) tissue culture • advantage • disadvantage • equipments • tissue culture media and solution • types of cells		8

• basic requirements for growth of cells • preparation of primary culture • subculture of cells • preservation of cell culture • inoculation of cell culture • CPE • Harvestation of inoculated cell culture		
Total hours	**30**	**30**

The midterm and practical exams are included during the semester

3.2- ILOs matrix:

Topic	A) Knowledge and understanding	B) Intellectual skills	C) Professional and practical skills	D) General and transferable skills
(1)Introduction (2)Fundamental characters of viruses	a1	,b1	-	d2, d4
(3) General Properties of viruses A. Physical properties of viruses. B. Chemical properties of viruses.	,a2, a3	,b2,b3,b4	-	,d1, d2, d4,
(4) Viral Haemagglutination	,a4	,b5	-	,d1, d2, d4,
(5) Virus cell relationships (virus multiplication)	,a5	,b6	-	,d1, d2, d4,
(6) Pathogenesis of viral infection	,a6	,b7	-	,d1, d2, d4,
(7) Interference phenomenona	,a7,a8	,b8	-	,d1, d2, d4,
(8) Viral immunity	,a9	,b9	-	,d1, d2, d4,
(9) Viral vaccines	,a10	,b10	-	,d1, d2, d4,
(10) Effect of physical & chemical agents on viruses	,a11	,b11	-	,d1, d2, d4,
(1) General scheme for viral isolation & identification	,a12	-	-	,d1, d3, d4,d5
(2) lab safety	,a13		,c1,c2,c3,c4	,d1, d3, d4,d5
(3) sampling		,b12	,c1	,d1, d3, d4,d5

(4) lab animal		,b13	,c2	,d1, d3, d4,d5
(5) fertile egg		,b13	,c3	,d1, d3, d4,d5
(6) tissue culture		,b13	,c4	,d1, d3, d4,d5

4- Teaching, learning and assessment methods:

ILOs		Teaching and Learning methods							assessment method				
		L	P&M	D&S	P	Ps	Bs	Gt	semester	midterm	oral	practical	written
Knowledge and understanding	a1	x	x	x	**0**	**0**	x	**0**	x	x	x	**0**	x
	a2	x	x	x	**0**	**0**	x	**0**	x	x	x	**0**	x
	a3	x	x	x	**0**	**0**	x	**0**	x	x	x	**0**	x
	a4	x	x	x	**0**	**0**	x	**0**	x	x	x	**0**	x
	a5	x	x	x	**0**	**0**	x	**0**	x	x	x	**0**	x
	a6	x	x	x	**0**	**0**	x	**0**	x	x	x	**0**	x
	a7	x	x	x	**0**	**0**	x	**0**	x	**0**	x	**0**	x
	a8	x	x	x	**0**	**0**	x	**0**	x	**0**	x	**0**	x
	a9	x	x	x	**0**	**0**	x	**0**	x	**0**	x	**0**	x
	a10	x	x	x	**0**	**0**	x	**0**	x	**0**	x	**0**	x
	,a11	x	x	x	**0**	**0**	x	**0**	x	**0**	x	**0**	x
	,a12	x	x	x	**0**	**0**	x	**0**	x	**0**	x	**0**	x
	,a13	x	x	x	**0**	**0**	x	**0**	x	**0**	x	**0**	x
Intellectual skills	b1	x	x	x	**0**	x	x	**0**	x	x	x	**0**	x
	b2	x	x	x	**0**	x	x	**0**	x	x	x	**0**	x
	b3	x	x	x	**0**	x	x	**0**	x	x	x	**0**	x
	b4	x	x	x	**0**	x	x	**0**	x	x	x	**0**	x
	b5	x	x	x	**0**	x	x	**0**	x	x	x	**0**	x
	b6	x	x	x	**0**	x	x	**0**	x	x	x	**0**	x
	b7	x	x	x	**0**	x	x	**0**	x	**0**	x	**0**	x
	b8	x	x	x	**0**	x	x	**0**	x	**0**	x	**0**	x
	b9	x	x	x	**0**	x	x	**0**	x	**0**	x	**0**	x
	b10	x	x	x	**0**	x	x	**0**	x	**0**	x	**0**	x
	b11	x	x	x	**0**	x	x	**0**	x	**0**	x	**0**	x
	b12	x	x	x	x	x	x	**0**	x	**0**	x	x	x
	,b13	x	x	x	x	x	x	**0**	x	**0**	x	x	x
al and practical	c1	**0**	x	x	x	x	**0**	x	x	**0**	x	x	**0**
	c2	**0**	x	x	x	x	**0**	x	x	**0**	x	x	**0**
	c3	**0**	x	x	x	x	**0**	x	x	**0**	x	x	**0**
	c4	**0**	x	x	x	x	**0**	x	x	**0**	x	x	**0**
General skills	d1	x	**0**	x	x	**0**	**0**	x	x	**0**	x	**0**	**0**
	d2	x	x	x	**0**	**0**	x	0	x	**0**	x	**0**	x
	d3	**0**	**0**	x	**0**	**0**	x	x	x	**0**	x	**0**	**0**
	d4	x	**0**	**0**	**x**	**0**	**0**	**0**	x	**0**	x	**0**	**0**
	,d5	**0**	**0**	x	x	x	x	x	x	**0**	x	x	**0**

L **:Lecture,** P&M**: Presentations & Movies,** D&S: **Discussions & Seminars P: Practical training,** Ps: **Problem solving,** Bs: **Brain storming,** Gt: **group teaching**

5- Assessment timing and grading:

Assessment method	timing	grade
Mid-term exam and semester work	6th week	15
Practical exam	14th week	20
oral exam	End of semester	15
Written exam	End of semester	50
total		100

6- List of references

6.1- Course notes: None

6.2- Essential books (text books)

- Alan J. Cann (2016) Principles of Molecular Virology.
- Jane Flint (2015) Principles of Virology
- John Carter (2007) Virology Principles And Applications
- J. Versteeg (1985) A colour atlas of virology

6.3- Recommended books

- Alan J. Cann (2016) Principles of Molecular Virology.
- Jane Flint (2015) Principles of Virology
- J. Versteeg (1985) A colour atlas of virology.

6.4- Periodicals, Web sites, . . . etc

- Veterinary bulletin.
- www.wsvma.org
- www.ekb.eg

7- Facilities required for teaching and learning

- Teaching hall
- Virology laboratory.
- Routine chemical kits for tissue culture.
- Tissue culture unit
- Fertile egg unit
- Experimental animal unit

Course coordinator: Prof. Dr. SAAD S.A. SHARAWI

Head of department Prof. Dr. SAAD S.A. SHARAWI

Signature: …… Date 1/10/2019