Specification for Virology (A) course

2025/2026

1-Basic information

1.	**Course title**	Virology **(A)**							
2.	**Course code**	VIR.312							
3.	**Department offering the course**	Virology							
4.	**Number of hours**	Theoretical	2	Practical	1(2)	Other	0	Total	3(4)
5	**Course Type**	√ **Obligatory** **Elective**							
6	**Level**	3rd year							
7	**Semester**	Fall							
8.	**Academic program**	Bachelor of Veterinary Medicine (BVM)							
9.	**University**	Benha University							
10.	**Faculty**	Veterinary medicine							
11.	**Name of course coordinator**	Prof. Dr. Ayman S. El-Habaa							
12.	**Course Specification Approval Date**	Faculty council/ 27-8-2025							
13	**Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)**	Department council on 8/7/2025							

2-Course overview

- **Course contents written in the program bylaw:**

Nature, structure, biology morphology and ecology of viruses; physical and chemical properties of viruses; classification of viruses affecting animal and human ; molecular study of viral host cell interaction; Tropism; pathogenesis and mechanisms of viral replication; specific and non- specific immune defense host mechanisms (humeral and /or cellular) to the virus; the role of IFN; Viral immune pathogenesis; Defense to viral infection; viral vaccinology.

3- Course Learning Outcomes "CLOs"

	(NARS) outcomes		Course outcomes	
	Code	**Text**	**Code**	**Text**
Knowledge and understanding	2.7	Various causes of animal diseases, their pathogenesis, macro- and micro-scopic pathological lesions, and laboratory diagnosis	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.
	2.9	General and specific epidemiological pattern of animal population diseases and the most effective immunization protocols	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.
	2.12	The accurate measurements of veterinary quarantine	a.12	Mention General scheme for viral isolation & identification
			a.13	Identify methods for virological laboratory safety
Intellectual skills	4.3	Inculcate a rigorous approach to problem identification and solving.	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.
	4.4	Proficiently secure diagnostic reasoning, develop problem lists and differential diagnosis in	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

		order to deductively and critically reach the most appropriate solution (s) and management of the addressed clinical problems		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
Practical skills	3.4	Perform clinical examination of diseased cases and collect relevant samples	c1	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
	3.5	Appropriately select and interpret findings of the common clinical and laboratory diagnostic procedures to reach and adopt the most convenient therapeutic and manage mental approach.	c2	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

	3.13	Minimize the risk of contamination, cross infection and predisposing factors of diseases	c3	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.
			c4	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
General skills	5.1	Work under pressure and / or contradictory conditions.	d1	Work under pressure during virology lab cession
	5.5	Search for new information and technology as well as adopt life–long self-learning ethics.	d2	Search for new information in field of virology
	5.6	Utilize computer and internet skills.	d3	Utilize computer and internet skills, read paper via internet in field of virology

4- Teaching and learning methods					
Lectures	√	**Discussion & seminar**	√	**Practical**	√
Presentation & movies	√	**Problem solving**	√	**Brain storming**	√
Others					

- Course Schedule:

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/ .....)	Training (Practical/Clinical/ .....)	Self-learning (Tasks/ Assignments / Projects/ ...)	Other (to be determined)
W1	Introduction General scheme for viral isolation & identification	**3(4)**	**2**	**1(2)**		0
W2	Fundamental characters of viruses lab safety	**3(4)**	**2**	**1(2)**		0
W3	General Properties of viruses, Physical properties of viruses. **sampling** 1-Collection	**3(4)**	**2**	**1(2)**	Formative quiz	0
W4	Chemical properties of viruses1) sampling Sampling 2-Preservation	**3(4)**	**2**	**1(2)**		0
W5	Chemical properties of viruses2 Sampling 3-preparation	**3(4)**	**2**	**1(2)**		0
W6	Viral Haemagglutination lab animal(1)	**3(4)**	**2**	**1(2)**	Formative quiz	0
W7	Semester work (one hour exam)	-	-	-		-
W8	Virus cell relationships (virus multiplication)1 lab animal (2)	**3(4)**	**2**	**1(2)**		0

W9	Virus cell relationships (virus multiplication)2 fertile egg 1	**3(4)**	**2**	**1(2)**		0
W10	Pathogenesis of viral infection1 fertile egg 2	**3(4)**	**2**	**1(2)**	Formative quiz	0
W11	Interference phenomenon fertile egg 3	**3(4)**	**2**	**1(2)**		0
W12	Viral immunity tissue culture 1	**3(4)**	**2**	**1(2)**		0
W13	Viral vaccines tissue culture 2	**3(4)**	**2**	**1(2)**		0
W14	Effect of physical & chemical agents on viruses tissue culture3	**3(4)**	**2**	**1(2)**	Formative quiz	0
W15	Practical exam	-	-	-		-

5- Assessment timing and grading:

a- Assessment methods (summative and formative)

1. **Formative assessment**: including (weekly quizzes, homework assignments and surveys).
2. **Summative assessment** including (quizzes, class activities, semester work, practical exam, oral exams and final written exams).

b- Assessment schedule and weight

Assessment method	Assessment Timing (Week Number)	Marks/ Scores	Percent Percentage of total course Marks
Semester work including one hour exam	7th week	10	10%
Formative assessment	Throughout the semseter	-----	------
Practical exam	15th week	30	30%
oral exam	End of semester	10	10%
Written exam	End of semester	50	50%
Assignments / Project /Portfolio/ Logbook	3rd, 6th , 10th ,14th week	-------	-------
Field training	--------	----------	-------
Other (Mention)	-------	--------	-------
Total		100	100%

6- Learning resources and supportive facilities:

Learning resources	**Main reference**	**Student handbook**: , Edit by Staff members
	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
	- Recommended books	•Alan J. Cann (2016) Principles of Molecular Virology. •Jane Flint (2015) Principles of Virology •J. Versteeg (1985) A colour

		atlas of virology.
	Periodicals, Web sites, . . . etc	•Veterinary bulletin. •www.wsvma.org •www.ekb.eg
	Learning platform	Thinqi
Supportive facilities	**Devices & instruments**	<u>Devices</u> □inverted Microscope □laminar air flow □deep freezer and refregirator □water bath □egg Incubator and Co2 incubator □hot air oven □autoclave <u>instruments</u> □tubes and epindorff □automatic and mouth Pipette □Cylinder □beaker □ Tissue culture media and solution □ balance
		1. Teaching hall 2. Virology laboratory. 3. Routine chemical kits for tissue culture. 4. Tissue culture unit 5. Fertile egg unit 6. Experimental animal unit

Matrices:

A- Content and 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	-	d1, d2, d3
(3) General Properties of viruses A. Physical properties of viruses. B. Chemical properties of viruses.	,a2, a3	,b2,b3,b4	-	d1, d2, d3
(4) Viral Haemagglutination	,a4	,b5	-	d1, d2, d3
(5) Virus cell relationships (virus multiplication)	,a5	,b6	-	d1, d2, d3
(6) Pathogenesis of viral infection	,a6	,b7	-	d1, d2, d3
(7) Interference phenomenona	,a7,a8	,b8	-	d1, d2, d3
(8) Viral immunity	,a9	,b9	-	d1, d2, d3
(9) Viral vaccines	,a10	,b10	-	d1, d2, d3
(10) Effect of physical & chemical agents on viruses	,a11	,b11	-	d1, d2, d3
(1) General scheme for viral isolation & identification	,a12	-	-	d1, d2, d3
(2) lab safety	,a13		,c1,c2,c3,c4	d1, d2, d3
(3) sampling		,b12	,c1	d1, d2, d3
(4) lab animal		,b13	,c2	d1, d2, d3
(5) fertile egg		,b13	,c3	d1, d2, d3
(6) tissue culture		,b13	,c4	d1, d2, d3

B- Teaching and learning methods and ILOs matrix:

ILOs		Teaching and Learning methods						
		L	P&M	D&S	P	Ps	Bs	Gt
Knowledge and understanding	a1	√			√	√		√
	a2	√			√	√		√
	a3	√			√	√		√
	a4	√			√	√		√
	a5	√			√	√		√
	a6	√			√	√		√
	a7	√			√	√		√
	a8	√			√	√		√
	a9	√			√	√		√
	a10	√			√	√		√
	,a11	√			√	√		√
	,a12	√			√	√		√
	,a13	√			√	√		√
Intellectual skills	b1				√			√
	b2				√			√
	b3				√			√
	b4				√			√
	b5				√			√
	b6				√			√
	b7				√			√
	b8				√			√
	b9				√			√
	b10				√			√
	b11				√			√
	b12							√
	,b13							√
Professional and practical skills	c1				√		√	
	c2				√		√	
	c3				√		√	
	c4				√		√	
General skills	d1		√			√	√	
	d2				√	√		√
	d3	√	√	√	√	√		

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

C- Assessment methods and ILOs matrix:

ILOs		assessment method				
		Formative assessment	semester	oral	practical	written
Knowledge and understanding	a1	√	√	√	√	√
	a2	√	√	√	√	√
	a3	√	√	√	√	√
	a4	√	√	√	√	√
	a5	√	√	√	√	√
	a6	√	√	√	√	√
	a7	√	√	√	√	√
	a8	√	√	√	√	√
	a9	√	√	√	√	√
	a10	√	√	√	√	√
	,a11	√	√	√	√	√
	,a12	√	√	√	√	√
	,a13	√	√	√	√	√
Intellectual skills	b1				√	
	b2				√	
	b3				√	
	b4				√	
	b5				√	
	b6				√	
	b7		√		√	
	b8		√		√	
	b9		√		√	
	b10		√		√	
	b11		√		√	
	b12		√			
	,b13		√			
Professional and practical	c1		√			√
	c2		√			√
	c3		√			√
	c4		√			√
General skills	d1			√	√	√
	d2			√	√	
	d3			√	√	
	d4			√	√	
	,d5			√		

-Course coordinator: Prof. Dr. Ayman S. El-Habaa
-Head of department Prof. Dr. Ehab M.El-Nahas
-Program coordinator: Prof. Dr. Mahmoud Abouelroos