
Special Virology

Benha University

Faculty of Veterinary Medicine

Course Specifications

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

Department offering the course: **Department of Virology**

Academic year / level: **Third year, 1st semester**

(Approved in this template by the department council on 15/6/2009 and updated on 10-1-2011)

A- Basic Information

Title: Special Virology

Code: Vet 00633b

Lecture: 1 hour / week

Practical: 3 hour / week

Total: 4 hour / week

B- Professional Information

1- Overall aims of course

- a- Provide the students with different patterns for classification of viruses.
- b- Provide the opportunity for the students to gain the necessary information about some Riboviruses (RNA-viruses) of veterinary medical importance.
- c- Apply the required knowledge about some Deoxyriboviruses (DNA- viruses) of veterinary medical importance.
- d- Experimental description and application of techniques used in viral identification.

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

a- Knowledge and understanding

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

- a.1- Know the basics of viruses classification depend on epidemiological and physico-chemical criteria.
 - a.2- Recognize viral families of medical veterinary importance belong to Riboviruses & Deoxyriboviruses..
 - a.3- Realize the basic of viral families classification & tell the viruses included in genera within the families know.
 - a.4- Define and illustrate diagrams for different viruses of veterinary importance.
 - a.5- Mention the type of host affected by different members of viral families belong to either Riboviruses or Deoxyriboviruses.
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- a.6- Describe the physico-chemical, biological and antigenic properties for different viral members related to Riboviruses & deoxyriboviruses families.
 - a.7- Mention the serological and non serological methods used for identification of suspected viral samples.
 - a.8- Trace the strategies to protect and combat each viral infection by vaccines.
 - a.9- Explain the basic of Lab. Diagnosis for each member of viruses having veterinary importance.
 - a.10- Describe the method used in molecular virology for viral detection and identification.
 - a.11- describe the aim and methods for viral purification

b- Intellectual skills

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

- b.1- Plan and apply classification for different viruses.
- b.2- Distinguish the natural & susceptible host affected by different viruses.
- b.3- Evaluate the general properties of viruses families & their members.
- b.4- Create a diagram for viruses structures & schemes for viruses classification.
- b.5- Differentiate between biological properties of different viruses.
- b.6- Choose the test method for virus control.
- b.7- Develop Lab. diagnosis for each viral infection.
- b.8- Link between the antigenic properties, viruses types and their control.
- b.9- Diagnosis and give prognosis for different viral infections.
- b.10- Compare between viruses belonging to same family or related to each other.
- b.11- Choose suitable techniques for viral identification.
- b.12- Interpret the results of different techniques used for viral identification.

a- Professional and practical skills

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

- c.1- Use aseptic conditions during techniques of virus identification.
 - c.2- Prepare and make serial dilutions from either antigen or antibody.
 - c.3- Prepare several working solutions like physiological & phosphate buffer saline.
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- c.4- Prepare purified serum preserve and treat the collected sera to get ride of inhibitory substances & media.
 - c.5- Prepare washed R.B.Cs with certain concentration for Haemagglutination and Haemagglutination inhibition tests.
 - c.6- Preparation of different hyper immune sera using known reference antigens.
 - c.7- Prepare the agrose to be used in AGPT and gel electrophoresis.
 - c.8- perform Haemagglutination, Haemagglutination inhibition, Haemadsorption and Haemadsorption test and interpret the results.
 - c.9- Perform infectivity titration and plaque count formation test for measurement of viruses infectivity.
 - c.10- Perform neutralization test using tissue culture & low fertile egg and discuss the results.
 - c.11- Perform both single radial & double immunodiffusion test & interpret the result.
 - c.12- Experience in fluorescent antibody technique for detect in of viral Ag in sequential tracing of viral protein Ag at different internal times .
 - c.13- Perform different types of for detection of either viral Age its Ags ELISA techniques with its modification.
 - c.14- Make nucleic acid extraction & identification.

d- General and transferable skills

After successful completion of the course the students should have fair

Experience in the following skills

- d.1- Biosafety.
 - d.2- Working under aseptic condition.
 - d.3- Cooperate and work in a team
 - d.4- Use the computer for searching
 - d.5- Mural and culture of virologist
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3- Contents :

Topic	No. of hours	Lecture	Practical
A. Classification of viruses	1	1	
B. Riboviruses (RNA-viruses):			
(1) Orthomyxoviridae	1 ½	3	
(2) Paramyxoviridae	1 ½		
(3) Coronaviridae	1	1	
(4) Picornaviridae	1	1	
(5) Birnaviridae	2	2	
(6) Reoviridae			
(7) Rhabdoviridae	1 ½	1 ½	
(8) Bunyaviridae	1	1	
(9) Retroviridae	1	1	
(10) Flaviviridae			
C. Deoxyriboviruses (DNA-viruses):			
(1) Poxviridae	1 ½	1 ½	
(2) Herpesviridae	1 ½	1 ½	
(3) Adenoviridae	½	½	
(1) Purification and concentration of viruses	3		
(2) Haemagglutination and haemagglutination inhibition test	6		6
(3) Assay of viral infectivity (virus titration)			
A. Quantal assay	6		6
B. Quantitative assay			
(4) Neutralization tests	6		6
(5) The immuno fluorescence procedure (fluorescent antibody technique)	3		3
(6) Immuno-Enzymatic assay (Enzyme-linked immunosorbent assay)	3		3
(7) Immunodiffusion technique (Agar gel precipitation test)	3		3
(8) Immuno electrophoresis	2		2
(9) Assay of interferon antiviral assay	1		1
(10) Molecular virology:			
• Extraction of viral nucleic acid.			
• Hybridization technique.			
• Nucleic acid analysis.			
• PCR and gene cloning			
• Mapping and sequencing			
Total	60	15	45

6- Teaching and learning methods

- 4.1- Lecturers
- 4.2- White board.
- 4.3- Positive slide projector.
- 4.4- Demonstration of instruments used in serological, non serological & molecular identification.
- 4.5- Using the laboratory to perform routine work of isolation of viral identification.
- 4.6- Photo & diagrams.

7- Student assessment methods

- 5.1- Semester work including oral, quiz written exams and searches to assess Knowledge information & intellectual and transferable skills.
- 5.2- Practical exam (final term) to assess professional & practical skills.
- 5.3- Oral exam (final term) to assess knowledge & information & intellectual skills.
- 5.4- Written exam (final term) to assess knowledge & information and intellectual skills.

Assessment schedule

Assessment 1 Semester work	week	4,8,12
Assessment 2 Practical exam	week	13
Assessment 3 Oral exam	week	15
Assessment 4 Written exam	week	15

Weighting of assessment

Mid-term examination	
Semester work	5%
Practical work	30%
Oral examination	15%
Final exam (written)	50%
Total	100%

8- List of references

8.1- Course notes

- 8.1.1. Veterinary virology (Part II: Systemic virology)
Gabr.F. El-Bagoury. Benha University
- 8.1.2. A laboratory manual for diagnostic virology
Gabr.F. El-Bagoury. Benha University

8.2- Essential books (text books)

- 8.2.1. Methods and techniques in virology (1993) by Pierre payment and Michel Trudel. Marcel Dekker, INC/New York.
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- 8.2.2. A colour Atlas of virology (1985) by J. Versteeg. Wolfe Medical Publications Ltd / Netherland.
- 8.2.3. Principles of bacteriology, virology and immunity (Vol. 4) (1984) by w.w.c. Topley and Wilson's. Edward Arnold Ltd / London.
- 8.2.4. Veterinary diagnostic virology (1992) by Anthony. E. Castro and Werner. P. Heuschele. Mosby-year book, INC/U.S.A.
- 8.2.5. Virology (1994) by Jay.A. Levey, Heinz Frankel. Conrat and Robert.A. Owens. Paramount Communication Company / U.S.A.

8.3- Recommended books

- Course notes.
- A colour Atlas of virology (1985) by J. Versteeg. Wolfe Medical Publications Ltd. / Netherland.
- Methods and Techniques in Virology (1993) by Pierre Payment and Michael Trudel. Marcel Dekker, INC / New York.
- Principles of bacteriology, Virology & Immunity (vol. 4) Virology (1984) by w.w.c. Topley and Wilson's Edward Arnold Ltd/London.

8.4- Periodicals, Web sites, . . . etc

foot and mouth disease bulletin
www.net.vet.mustle.edu/
www.net.vet.mustle.edu/vet.med.htm
www.altvetmed.com/
www.wsvma.org/

9- Facilities required for teaching and learning

- 1- Laboratory.
- 2- Routine chemical kits for serological & molecular techniques.
- 3- Equipments: water bath, electrophoresis, ELISA reader, ultracentrifuges incubators, fluorescent microscope and thermocycler and transilluminator, spectrophotometer.
- 4- Data show.
- 5- Computer Lab.

Course coordinator:

Prof.Dr. Gabr F. El-Bagoury

Head of department

Prof.Dr. Gabr F. El-Bagoury
