



University of Sadat City  
Faculty of Veterinary Medicine  
Dept. of Bacteriology, Mycology and Immunology  
(2014-2015)



## Microbiology of Invertebrates

(678P)

### PhD COURSE SPECIFICATION

#### A. BASIC INFORMATION

<b>University:</b>	<b>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 (Bacteriology, Mycology and Immunology)</b>
<b>Department offering the Course:</b>	<b>Bacteriology, Mycology and Immunology</b>
<b>Course code:</b>	<b>678P</b>
<b>Course title:</b>	<b>Microbiology of Invertebrates</b>
<b>Lecture (hr/week):</b>	<b>1</b>
<b>Practical (hr/week):</b>	<b>2</b>
<b>Course coordinator:</b>	<b>Dr. Reda Tarabees</b>

## **B. PROFESSIONAL INFORMATION**

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

*Upon successful completion of the course, the student will be able to:*

- )] Understand the advanced concepts and theories about the Microbiology of Invertebrates.
- )] The Immune response of the bacterial and fungal pathogens of Invertebrates .
- )] Achieve competency in modern laboratory technology using PCR and other molecular techniques.

### **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. List the species of different bacterial and fungal classes affecting Invertebrates.
- a.2. Realize the antigenic structure of every bacterial species affecting Invertebrates
- a.3. Describe the immune response of these species toward these various fungal and bacterial infections.
- a.4. Recognizes the culturing requirements and growth characteristics for every bacterial and fungal species affecting Invertebrates.
- a.5. Recognize the cellular products (extracellular toxins and enzymes) produced by different bacterial and fungal species affecting Invertebrates.
- a.6. Describe the pathogenesis and clinical picture for different bacteria and fungus affecting Invertebrates.
- a.7. Realize the modern advanced techniques for determination of theses of bacterial infections affecting Invertebrates.
- a.8. Be aware with methods of treatment, control and prevention of bacterial and fungal infections of Invertebrates.

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

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

- b.1. Interpret the results of microscopical and serological tests for the most common microbiological infections of Invertebrates.
- b.2. Evaluate the results of immunodiagnostic tests used for diagnosis of different bacterial infections that affecting Invertebrates.
- b.3. Choose the appropriate molecular techniques for isolation and identification each bacterium.
- b.4. Interpret the data related to bacterial infections and scientific research in the field of microbiology of Invertebrates.
- b.5. Write a professional medical report in the field of microbiology of Invertebrates.
- b.6. Develop a plan for enhancing performance in the field of microbiology of Invertebrates.
- b.7. Make creative approaches for solving technical problems or issues associated with bacterial diseases of Invertebrates.

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

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

- c.1. Identify bacteria species based on microscopic examination of stained smears.
- c.2. Choose and prepare appropriate culture media for a specific microorganism.
- c.3. Apply biochemical tests for identification of bacterial species.
- c.4. Perform different serological tests for identification of bacteria.
- c.5. Apply immunodiagnostic procedures for diagnosis of bacterial infections.
- c.6. Conduct modern molecular techniques for detection and classification of bacteria.

#### d) GENERAL AND TRANSFERABLE SKILL

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

- d.1. Communicate effectively.
- d.2. Demonstrate an ability to learn independently for a career of lifelong learning.
- d.3. Use information technology to serve the professional practice.
- d.4. Manage time efficiently.
- d.5. Set tools and indicators for assessment of the performance of others.

#### 3) Topics and contents

Topics	Lecture(hr	practical (hour)	Total hours
1- types of bacteria which infect invertebrates) Advanced).	44	...	88
2- The diagnostic serological test) Advanced).	....	15	15
3- Pathogenicity and laboratory animal inoculation) Advanced).	...	15	15
4- Methods of anaerobic cultivation) Advanced).	...	5	5
5- Staining and morphological studies for all microbes taken through the course) Advanced).	...	20	20
6- Uses of recent techniques in diagnosis) Advanced).	...	15	15
7- Sterilization and disinfection) Advanced).	....	10	10
8- Chemotherapeutic agent) Advanced).	...	10	10
<b>Total</b>	<b>44</b>	<b>88</b>	<b>132</b>

#### 4) Teaching and learning methods

- a. Lectures to gain knowledge and understanding skills. The teacher usually uses all the available teaching tools like data show. The lectures usually take the form of open discussion.
- b. Writing a review paper about the field of specialization to gain the skills of information collection, self-learning and presentation.
- c. Practical and lab sessions to gain practical skills.
- d. Seminar for self-learning and skills of scientific presentation.

#### 5) Student assessment

##### a. METHODS:

- Ñ Written exam to assess knowledge, information and intellectual skills. Besides it evaluates the review paper prepared by the student for self-learning.
- Ñ Practical exam to assess professional and practical skills.
- Ñ Oral exam to assess knowledge and information and intellectual skills. In addition it measures the self-learning 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	<b>1-8</b>	<b>2,3,6,7</b>		
Practical exam		<b>1,2,3,6</b>	<b>1-6</b>	
Oral exam	<b>1-8</b>	<b>3,5,7</b>		
Student activities				<b>1-5</b>

**c. WEIGHT OF ASSESSMENTS:**

<b>Self-Learning Activities included:</b>		
Assay on a specific topic Self-Assessment Exercise Enhancing Questioning Skills Open discussion		
<b>Student Assessment Methods</b>		
	<b>Exams and activities</b>	<b>Weight (%)</b>
	<b>1- Final written exam</b>	<b>50</b>
	<b>2- Final Practical exam</b>	<b>20</b>
	<b>3- Final oral exam</b>	<b>20</b>
	<b>4- Self-learning activities</b>	<b>10</b>
	<b>Total</b>	<b>100</b>

<b>Assessment</b>	<b>Evidence</b>
Final written exam	Marked and signed written paper
Practical exam	Marked and signed practical exam paper
Oral exam	Signed list of oral exam marks
Student activities	For assessment of knowledge and general and transferable skills

**d. List of references**

**6.1. Essential textbooks**

- ] **Veterinary Microbiology and Microbial Disease.** P. J. Quinn, B. K. Markey, F. C. Leonard, P. Hartigan, S. Fanning, E. S. FitzPatrick., Wiley-Blackwell, 2011.
- ] **Veterinary Microbiology.** Dwight C. Hirsh, N. James MacLachlan, Richard L. Walker. Wiley-Blackwell, 2004.

**6.2. Recommended books**

- ] **Veterinary Microbiology.** D. Scott McVey, Melissa Kennedy, M. M. Chengappa. Wiley-Blackwell, 2013.
- ] **Microbiology: An Introduction,** Gerard J. Tortora, Berdell R. Funke, Christine L. Case.

Benjamin Cummings, 2012.

) **Principles and Practice of Clinical Bacteriology**, Stephen Gillespie, Peter M. Hawkey, Wiley, 2006.

### **6.3. Periodicals**

- ) Veterinary Microbiology
- ) Diagnostic Microbiology and Infectious Disease
- ) FEMS Immunology and Medical Microbiology
- ) FEMS Microbiology Reviews
- ) International Journal of Food Microbiology
- ) Journal of Microbiology, Immunology and Infection
- ) Research in Microbiology
- ) Systematic and Applied Microbiology
- ) Journal of Microbiology Research

### **6.4. Web sites**

- ) Veterinary Microbiology – ResearchGate- [http://www.researchgate.net/journal/0378-1135\\_Veterinary\\_Microbiology](http://www.researchgate.net/journal/0378-1135_Veterinary_Microbiology)
- ) American Society Of Microbiology
- ) Veterinary Microbiologist - Animal Careers - About.com
- ) Bacteriology: Bacteriology: Animal Health Diagnostic Center- <https://ahdc.vet.cornell.edu/sects/bact/>
- ) o [asmnews@asmusa.org](mailto:asmnews@asmusa.org)
- ) VetBact- <http://www.vetbact.org/vetbact/>
- ) o <http://www.phage.org/black09.htm>
- ) o [http://www.microbe.org/microbes/virus\\_or\\_bacterium.asp](http://www.microbe.org/microbes/virus_or_bacterium.asp)
- ) o <http://www.bact.wisc.edu/Bact330/330Lecturetopics>
- ) o [http://whyfiles.org/012mad\\_cow/7.html](http://whyfiles.org/012mad_cow/7.html)
- ) o <http://www.microbelibrary.org/>
- ) o <http://www.hepnet.com/hepb.htm>
- ) o [http://www.tulane.edu/~dmsander/Big\\_Virology/BVHomePage.html](http://www.tulane.edu/~dmsander/Big_Virology/BVHomePage.html)
- ) o <http://www.mic.ki.se/Diseases/c2.html>
- ) o <http://www.med.sc.edu:85/book/welcome.htm>
- ) o [http://www.biology.arizona.edu/immunology/microbiology\\_immunology.html](http://www.biology.arizona.edu/immunology/microbiology_immunology.html).

## **6) Facilities required for teaching and learning**

- 7.1** Data-show.
- 7.2** Microscopes and media for characterization of microorganisms.
- 7.3** Network for technology transfer.
- 7.4** Bacteriology lab.
- 7.5** Biotechnology lab.
- 7.6** Computer.

	<b>Course coordinators</b>	<b>Head of department</b>
<b>Name</b>	Dr. Reda Tarabees	Dr. Alaa El Din Moustapha
<b>Signature</b>		

### Matrix alignment of course topics and ILOs

Topics	Lecture(hr)	practical (hour)	Total hours	K.U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
1- types of bacteria which infect invertbrates) Advanced).	44	...	88	1-8	1-7		1-5
2- The diagnostic serological test) Advanced).	....	15	15		1,4,5,6,7	3-5	1-5
3- Pathogenicity and laboratory animal inoculation) Advanced).	....	15	15		6-7	5-6	1-5
4- Methods of anaerobic cultivation) Advanced).	...	5	5		2,7	2	1-5
5- Staining and morphological studies for all microbes taken through the course) Advanced).	...	20	20		1	1	1-5
6- Uses of recent techniques in diagnosis) Advanced).	...	15	15		2,3	5	1-5
7- Sterilization and disinfection) Advanced).	....	10	10		6-7	1-6	1-5
8- Chemotherapeutic agent) Advanced).	...	10	10		7	6	1-5
<b>Total</b>	<b>44</b>	<b>88</b>	<b>132</b>				