Diagnostic Microbiology

(679P)

PhD COURSE SPECIFICATION

A. BASIC INFORMATION

University:	**Sadat City**
Faculty:	**Veterinary Medicine**
Program on which the course is given:	**PhD in Veterinary Medical Sciences (Bacteriology, Mycology and Immunology)**
Department offering the Course:	**Bacteriology, Mycology and Immunology**
Course code:	**679P**
Course title:	**Diagnostic Microbiology**
Lecture (hr/week):	**2**
Practical (hr/week):	**2**
Course coordinator:	**Dr. Eman Abdeen**

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 diagnostic microbiology.
- Achieve competency in modern advanced laboratory technology.

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 bacteria and outline of their isolation and identification modern techniques of classification.
a.2. Realize the antigenic structure of every bacterial species.
a.3. Describe the morphology and fine structures of every bacterial species.
a.4. Recognizes the culturing requirements and growth characteristics for every bacterial species.
a.5. Recognize the cellular products (extracellular toxins and enzymes) produced by different bacterial species.
a.6. Describe advanced concepts of bacterial virulence, bacterial genetics, and host immune response and modern techniques used in their evaluation.
a.7. Realize the modern techniques of isolation and identification using PCR, FACS .
a.8. Be aware with methods of treatment, control and prevention of bacterial infections.

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.
b.2. Evaluate the results of immunodiagnostic tests used for diagnosis of bacterial infections.
b.3. Choose the appropriate molecular techniques for each bacterium.
b.4. Interpret the data related to bacterial infections and scientific research.
b.5. Write a professional medical report in the field of veterinary bacteriology.
b.6. Develop a plan for enhancing performance in the field of bacteriology.
b.7. Make creative approaches for solving technical problems or issues associated with bacterial diseases.

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 such as PCR, FACS and Western blotting for detection and classification of bacteria.
c.7. Write scientific reports in the field of specific bacteriology.

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.
d.6. Skills of writing and prepare papers for publishing.

3) Topics and contents

Item	Lectures	practical	Total hours
General bacteriology (advanced)	٣٣		٣٣
General mycology (advanced)	٣٠		٣٠
General immunology (advanced)	٢٥		٢٥
Methods of sterilization and disinfection		٢٠	٢٠
Methods of isolation and identification of different bacteria		٣٠	٣٠
Serological tests		١٠	١٠
Molecular methods for bacterial isolation and identification		٢٨	٢٨
Total hours	٨٨	٨٨	١٧٦

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:
- õ Written exam to assess knowledge, information and intellectual skills. Besides it evaluates the review paper prepared by the student for self –learning.
- õ Practical exam to assess professional and practical skills.
- õ 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:

	K.U (a)	I.S (b)	P.P.S (c)	G.S (d)
Written exam	1-8	1-7		
Practical exam		6	1-7	
Oral exam	1,3,5,6	4,5,6,7		
Student activities				1-6

c. WEIGHT OF ASSESSMENTS:

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

Assessment	Evidence
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
- 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
- VetBact- http://www.vetbact.org/vetbact/
- o http://www.phage.org/black09.htm
- o 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
- o http://www.microbelibrary.org/
- o http://www.hepnet.com/hepb.htm
- o 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.

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.

	Course coordinators	Head of department
Name	Dr. Eman Abdeen	Dr. Alaa El Din Moustapha
Signature		

Matrix alignment of course topics and ILOs

Topic	No. of hours /week		Total hours	ILOs			
	Lect.	Pract.		K.U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
Item	**Lectures**	**practical**	**Total hours**				
General bacteriology (advanced)	٣٣		٣٣	**1-8**	**1-7**		**1-6**
General mycology (advanced)	٣٠		٣٠	**1-8**	**1-7**		**1-6**
General immunology (advanced)	٢٥		٢٥	**1-8**	**1-7**		**1-5**
Methods of sterilization and disinfection		٢٠	٢٠	**1-8**	**1-7**	**1-7**	**1-5**
Methods of isolation and identification of different bacteria		٣٠	٣٠	**1-8**	**1-7**	**1-7**	**1-5**
Serological tests		١٠	١٠	**1-8**	**1-7**	**1-7**	**1-5**
Molecular methods for bacterial isolation and identification		٢٨	٢٨	**1-8**	**1-7**	**1-7**	**1-5**
Total hours	٨٨	٨٨	١٧٦	**1-8**	**1-7**	**1-7**	**1-6**