



Beni Suef University
Faculty of Veterinary Medicine
Department of Bacteriology, Mycology and Immunology

Program Specification for Ph.D. Degree
2017-2018

A-Basic information:

1- Program title: *PhD.*

2- Program type: *Single*

3- Department offering program: **Bacteriology, Mycology and Immunology**

4-Academic year:

5-Approval date of Department Council:

6-Approval date of Faculty Council:

7-External evaluator: *Prof. Dr. Ahmed Mohamed Ahmed Ammar*

B-Professional information:

1- Overall aims of the program:

1) Program aims to:

1. Provide the students with knowledge of specialized areas of microbiology practice and having an appreciation of the current range of theoretical and research understanding in those areas.
2. Master the various methods of data collection and application of analytical and critical approach in relevant specialty.
3. Create, design and explore a research in a specialized area and evaluate this research with appropriate.
4. Provide the students with current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology.
5. Develop the appropriate use of modern research techniques and applications used in microbiology for mastering a wide range of veterinary professional skills.
6. Design, write and present high quality dissertations and scientific papers.
7. Carry out a range of advanced skills and laboratory techniques, including the purification of isolated microbial pathogens and analyses of their proteins and nucleic acids for downstream applications.
8. Have skills for diagnosis of different pathogens as well as solve their problems and make decision based on available information.
9. Develop the communication and IT skills effectively and leading the team.

10. Utilize efficiently the available resources and improving as well as offering new resources.

2- Intended Learning Outcomes (ILOs):

a- Knowledge and Understanding:

- **The PhD's program graduate must be able to:**

- a1- Acquire up to date concepts and in-depth knowledge in bacteria and fungi associated with veterinary public health significance.
- a2- Perceive the current theories and advanced microbiology scientific researches.
- a3- List different bacteria and fungi of veterinary and zoonotic importance.
- a4- Be aware efficiently of the effects of scientific research on community development and environment protection.
- a5- Be acquainted with the structure, components, mechanisms and disorders of the immune system.
- a6- Apply the advanced research techniques used in the microbiology and immunology fields.
- a7- Apply recent molecular biology techniques in research.
- a8- Sustain quality control measures in veterinary professional practices and acquire the knowledge and understanding required for protecting environment from microbial infections and planning the infection management policy.
- a9- Be aware with theories and fundamentals of relevant and supportive sciences to the thesis
- a10- Collect relevant information in the field of his/her thesis.

b- Intellectual Skills:

- **The PhD's program graduate must be able to:**

- b1- Analyze, evaluate and interpret scientific microbiology information autonomously using integrated approaches and accurately assess and criticize the applied researches for standardization and conclusion.
- b2- Solve specialized microbiology problems based on the data available.
- b3- Recognize the ethical constraints associated with the subject area and the ability to relate these to his/her experience.
- b4- Diagnose and differentiate between different bacterial and fungal diseases.
- b5- Judge on the performance of immune system through the immune responses mediated by immune cells.
- b6- Contribute to the development of the subject through applied research.
- b7- Conduct a research study and write a scientific article on a research problem in the field related to his/her thesis.
- b8- Make decision based on available information in different professional contexts.
- b9- Discuss bases on proofs and evidences in microbiology.

c- Professional and Practical Skills:

The PhD's program graduate must be able to:

- c1- Master the basic and modern professional practical skills relevant to microbiology and achieve a high efficiency in laboratory skills.
- c2- Improve ability to engage in professional and academic communication with others in a specialist field.
- c3- Manage and handle the different infected specimens safely and work in accordance with safety rules in a microbiology laboratory.
- c4- Perform the different biochemical, serological and molecular techniques and apply different bacterial virulence tests used for lab diagnosis of microbial infections.
- c5- Write and assess professional reports in microbiology.
- c6- Evaluate and improve the available and required material, methods, tools and equipment in veterinary Microbiology research.
- c7- Explain the basic genetic properties of microorganism and evaluate the effects of these properties to disease formation.
- c8- Master an appropriate range of basic and modern professional skills, and the use of appropriate technological means to serve his/her thesis.
- c9- Develop plans and experimental design for performing experiments related to his/her thesis.

d- General and Transferable Skills

• The PhD's program graduate must be able to:

- d1- Communicate effectively by all means and improve skills in written and verbal communication of complex information
- d2- Use informational technology to serve the development of professional practice.
- d3- Be responsible for learning and have the ability to work with and motivate others and evaluate their performance.
- d4- Achieve confidence in his/her thinking abilities and apply self-assessment and continuous learning.
- d5- Utilize different sources of information and knowledge in the field of his/her thesis.
- d6- Write scientific article according to the basics of scientific research to serve his/her thesis.
- d7- Present research finding in oral and written from using appropriate software (e.g., power point, word, excel and database).
- d8- Work in a team and lead teams.
- d9- Manage scientific meetings and discussions as well as manage time efficiently.

2- Academic standers:

* The faculty mission, vision and strategic objective are confirmed to the academic standard. The learning outcomes are inline with the department and the faculty mission.

* Postgraduates NARS (March 2009) Master degree chapter issued by national authority for quality assurance and accreditation of education (NAQAAE) and Veterinary medicine post graduate academic standards (ARS) for the faculty of

veterinary medicine, Beni-Suef University, Beni-Suef, Egypt are selected to confirm the appropriateness of the academic standards .

4- Program Structure and Contents

A- Program duration: At least three full years from the approval of registration by the Faculty Council and maximum five years. The faculty council has the right to give the applicant another period according to the supervisor request and after obtaining the opinion of the concerned department council taking in consideration the executive regulations of the law organizing the university.

- **Complementary study:** One academic year.
- **Thesis:** Two academic years.

B- Program structure: 3-5 preliminary courses

Hours/ week:

Theoretical Practical Total

Preliminary courses

Code	Course title	Hours /week		Academic year	Teaching duration
		theoretical	practical		
According to selected courses	Selected (3-5) PhD courses from the various Faculty Departments programs depending on the thesis title.	5-8	6-8	Preliminary year	36 weeks

C- Courses contents

See courses specification

5- Program Admission Requirements

* According to the Faculty of Veterinary Medicine, Beni-Suef University Bylaws for Post Graduate Programs, applicants should have a master degree in the specialization subject he will register in one of the Egyptian Universities or an equivalent degree from any approved university or another recognized scientific institute.

* According to Beni-Suef University requirements, all applicants for postgraduate studies should fulfill preliminary courses on the following subjects:

1-English language (Toefl or equivalent degree)

* Admission to the program is open during March and September annually.

*The faculty council has the right to suspend the student enrolment for a certain period if he has acceptable excuse preventing him from continuing his study or research.

6. Regulations for Progression and Program Completion

After finishing the preliminary courses, the graduate student will be eligible to sit for the examination according to the following roles:

No. of course teaching hours/ week	Allowed written examined time	Degree	
		Theoretical	Practical and oral exam
≥ 3 hours	3 hours	50	50
≤ 3 hours	2 hours	25	25

-The faculty council has the right to deprive the applicant from entering the exams if his attendance courses are less than 75%.

-Failure or depriving from entering one or more course did not requires reexamination of successful passed courses.

-The applicant should submit a seminar within 2years after registration about his research and specialization subject filed that accepted by a committee of professors and assistant professors (3 in number).

-the applicant should submit the thesis that accepted by the judging committee in an open discussion and the following polices should be met:

- Pass all preliminary curriculums successfully.
- Acceptance of the seminar presented by the applicant.

-The applicant should publish at least two scientific papers from the thesis in local or international journals.

Qualification grades:

Excellent	≥ 90
Very good	≥80
Good	≥70
Pass	≥60
Failed	45 to less than 60 weak
	Less than 45 Very weak

After passing, the graduate starts research for Ph.D. Thesis at the beginning of the second year.

The candidate will receive his degree after evaluating and approving the thesis by a committee according to University regulations.

7-Graduate student assessment

A: Assessment Tools

According the Faculty of Veterinary Medicine, Beni-Suef University Bylaws for

Post Graduate, students should be assessed at the end of preliminary year and the thesis should be evaluated and approved by a committee after at least three years from registration date according to University regulations.

1-Preliminary year

Assessments methods for each course	practical exam	Oral exam	Written exam
Time of Assessments	By the end of the year	By the end of the year	By the end of the year
Marks	25	25	50

Assessments methods	Matrix alignment of the measured ILOs			
	K&U (a)	I.S (b)	P&P. S (c)	G&T. S (d)
Written exam	a1-a10 (all)	b1,b2,b3,b4,b5,b7	c1,c7,c8	d4,d5,d6
Practical exam	a3,a6,a7,a8,a10	b1,b2,b3,b4,b8	c1,c2,c3,c4,c5, c6,c9	d2, d4
Oral exam	a1-a10 (all)	b1-b8	c1,c7,c8	d4,d5,d6,d7,d9

Ph.D. Thesis:

The Ph.D. students should prepare a thesis in either Bacteriology, Mycology or Immunology.

The department and the ethical committees must approve the protocol of the research. The thesis includes a review part with a practical part. The thesis is supervised by two or more staff members and may include other specialties according to the nature of the research. The thesis should be evaluated and approved by a committee according to University regulations.

B- Matrix alignment of the measured ILOs

8- Evaluation of Program Intended Learning Outcomes

Evaluator	Tool	Sample
1. Post graduate Students	Questionnaire at the end of the program	All the PG students
4. External Evaluators	Review program and courses Attending the final exam	Once before implementation annual report
5. College Quality Assurance committee	Annual program reviewer	

Course Coordinator

Dr. Hala Sayed Hassan

Ass. Prof. of Bacteriology, Mycology
and Immunology, Faculty of Veterinary
Medicine,
Beni-Suef University

Head of the department

Prof. Dr. Ismail Abd El-Hafeez Radwan

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University

**Ph.D. Program Specification Matrix (Program ILOS with
Academic standers ARS)**

Academic standers		Knowledge and understanding					Intellectual skills									Professional and practical skills					General and transferable skills						
		a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	b6	b7	b8	b9	c1	c2	c3	c4	c5	d1	d2	d3	d4	d5	d6	d7
Program ILOs	Knowledge and understanding	a1	x																								
		a2		x																							
		a3	x																								
		a4					x																				
		a5	x																								
		a6	x	x	x																						
		a7	x	x	x																						
		a8				x	x																				
		a9	x																								
		a10	x																								
Intellectual skills	b1					x		x		x		x															
	b2						x																				
	b3						x																				
	b4						x	x																			
	b5					x																					
	b6										x		x														
	b7									x																	
	b8											x															
	b9														x												
Professional and practical skills	c1														x			x									
	c2																x										
	c3																x										
	c4																		x								
	c5															x											
	c6																x			x							
	c7																										
	c8															x			x								
	c9															x		x	x								
General and transferable skills	d1																			x					x		
	d2																			x			x				
	d3																				x		x		x		
	d4																					x					

	c2	56,61,82,88,89,92,99,110,114,125,170,172,185, 190,196 and thesis
	c3	83,84,85,86,196 and thesis
	c4	82,87,88,89 and thesis
	c5	87,88,89 and thesis
	c6	82,87,88,89 and thesis
	c7	42,82,87 and thesis
	c8	82,87,88,89 and thesis
	c9	87,88,89,213 and thesis
General and transferable skills	d1	All selective courses
	d2	All selective courses
	d3	All selective courses
	d4	All selective courses
	d5	All selective courses
	d6	All selective courses
	d7	All selective courses
	d8	All selective courses
	d9	All selective courses

Program aims – ILOS Matrix for the master Ph.D. program

Program aims		Program aims									
		Provide the students with knowledge of specialized areas of microbiology practice and having an appreciation of the current range of theoretical and research understanding in those areas.	2.Create, design and explore a research in a specialized area and evaluate this research with appropriate	3. Be aware of current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology	Provide the students with current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology.	5.Designing, writing and presenting high quality dissertations and scientific papers	6.Carry out a range of advanced skills and laboratory techniques, including the purification of isolated microbial pathogens and analyses of their proteins and nucleic acids for downstream applications.	7.Have skills for diagnosis of different pathogens as well as solve their problems and make decision based on available information.	8.Develop the communication and IT skills effectively and leading the team.	9. Be aware of the postgraduate role in community development and environment protection	10. Consider continuous, self-learning and experience transfer.
Knowledge and understanding	a.1- Acquire up to date concepts and in-depth knowledge in bacteria and fungi associated with veterinary public health significance.	✓		✓			✓		✓		
	a2- Perceive the current theories and advanced microbiology scientific researches.	✓				✓			✓		
	a3- List different bacteria and fungi of veterinary and zoonotic importance.			✓			✓		✓		

Program aims	Program aims									
	Provide the students with knowledge of specialized areas of microbiology practice and having an appreciation of the current range of theoretical and research understanding in those areas.	2.Create, design and explore a research in a specialized area and evaluate this research with appropriate	3. Be aware of current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology .	Provide the students with current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology.	5.Designing, writing and presenting high quality dissertations and scientific papers	6.Carry out a range of advanced skills and laboratory techniques, including the purification of isolated microbial pathogens and analyses of their proteins and nucleic acids for downstream applications.	7.Have skills for diagnosis of different pathogens as well as solve their problems and make decision based on available information.	8.Develop the communication and IT skills effectively and leading the team.	9. Be aware of the postgraduate role in community development and environment protection	10. Consider continuous, self-learning and experience transfer.
Program ILOS	a4- Be aware efficiently of the effects of scientific research on community development and environment protection.								✓	
	a5- Be acquainted with the structure, components, mechanisms and disorders of the immune system.		✓							
	a6- Apply the advanced research techniques used in the microbiology and immunology fields.		✓			✓	✓			
	a7- Apply recent molecular biology techniques in research				✓	✓	✓			
	a8- Sustain quality control measures in veterinary professional practices and								✓	

Program aims		Program aims									
		Provide the students with knowledge of specialized areas of microbiology practice and having an appreciation of the current range of theoretical and research understanding in those areas.	2.Create, design and explore a research in a specialized area and evaluate this research with appropriate	3. Be aware of current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology .	Provide the students with current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology.	5.Designing, writing and presenting high quality dissertations and scientific papers	6.Carry out a range of advanced skills and laboratory techniques, including the purification of isolated microbial pathogens and analyses of their proteins and nucleic acids for downstream applications.	7.Have skills for diagnosis of different pathogens as well as solve their problems and make decision based on available information.	8.Develop the communication and IT skills effectively and leading the team.	9. Be aware of the postgraduate role in community development and environment protection	10. Consider continuous, self-learning and experience transfer.
Program ILOS											
	acquire the knowledge and understanding required for protecting environment from microbial infections and planning the infection management policy.										
	a9- Be aware with theories and fundamentals of relevant and supportive sciences to the thesis			✓			✓				
	a10- Collect relevant information in the field of his/her thesis.	✓					✓				
Intellectual skills	B1-Analyze, evaluate and interpret scientific microbiology information autonomously using integrated approaches and accurately assess and criticize the applied researches for	✓						✓			

Program aims		Program aims								
		Provide the students with knowledge of specialized areas of microbiology practice and having an appreciation of the current range of theoretical and research understanding in those areas.	2.Create, design and explore a research in a specialized area and evaluate this research with appropriate	3. Be aware of current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology .	Provide the students with current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology.	5.Designing, writing and presenting high quality dissertations and scientific papers	6.Carry out a range of advanced skills and laboratory techniques, including the purification of isolated microbial pathogens and analyses of their proteins and nucleic acids for downstream applications.	7.Have skills for diagnosis of different pathogens as well as solve their problems and make decision based on available information.	8.Develop the communication and IT skills effectively and leading the team.	9. Be aware of the postgraduate role in community development and environment protection
Program ILOS	standardization and conclusion.									
	b2- Solve specialized microbiology problems based on the data available.				✓			✓		
	B3- Recognize the ethical constraints associated with the subject area and the ability to relate these to his/her experience.				✓					
	b4- Diagnose and differentiate between different bacterial and fungal diseases.						✓	✓		
	b5- Judge on the performance of immune system through the immune responses mediated by immune cells.		✓							
	b6-Contribute to the development of the subject through applied research.				✓					

Program aims		Program aims									
		Provide the students with knowledge of specialized areas of microbiology practice and having an appreciation of the current range of theoretical and research understanding in those areas.	2.Create, design and explore a research in a specialized area and evaluate this research with appropriate	3. Be aware of current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology .	Provide the students with current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology.	5.Designing, writing and presenting high quality dissertations and scientific papers	6.Carry out a range of advanced skills and laboratory techniques, including the purification of isolated microbial pathogens and analyses of their proteins and nucleic acids for downstream applications.	7.Have skills for diagnosis of different pathogens as well as solve their problems and make decision based on available information.	8.Develop the communication and IT skills effectively and leading the team.	9. Be aware of the postgraduate role in community development and environment protection	10. Consider continuous, self-learning and experience transfer.
Program ILOS	b7- Conduct a research study and write a scientific article on a research problem in the field related to his/her thesis.		✓			✓					
	b8- Make decision based on available information in different professional contexts.	✓						✓			
	b9-Discuss bases on proofs and evidences in microbiology.	✓									
Practical and professional skills	C1-Master the basic and modern professional practical skills relevant to microbiology and achieve a high efficiency in laboratory skills.						✓	✓			
	c2- Improve ability to engage in professional and academic communication with others in a specialist field.								✓		

Program aims		Program aims								
		Provide the students with knowledge of specialized areas of microbiology practice and having an appreciation of the current range of theoretical and research understanding in those areas.	2.Create, design and explore a research in a specialized area and evaluate this research with appropriate	3. Be aware of current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology .	Provide the students with current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology.	5.Designing, writing and presenting high quality dissertations and scientific papers	6.Carry out a range of advanced skills and laboratory techniques, including the purification of isolated microbial pathogens and analyses of their proteins and nucleic acids for downstream applications.	7.Have skills for diagnosis of different pathogens as well as solve their problems and make decision based on available information.	8.Develop the communication and IT skills effectively and leading the team.	9. Be aware of the postgraduate role in community development and environment protection
Program ILOS										
	c3- Manage and handle the different infected specimens safely and work in accordance with safety rules in a microbiology laboratory.						✓			
	c4- Perform the different biochemical, serological and molecular techniques and apply different bacterial virulence tests used for lab diagnosis of microbial infections.						✓	✓		
	c5- Write and assess professional reports in microbiology.					✓				
	c6- Evaluate and improve the available and required material, methods, tools and equipment in veterinary Microbiology research.				✓					
	c7- Write efficiently scientific paper and dissertation according to the basics of scientific research.					✓				
	c8- Master an appropriate range of basic and modern professional skills,							✓		

Program aims		Program aims									
		Provide the students with knowledge of specialized areas of microbiology practice and having an appreciation of the current range of theoretical and research understanding in those areas.	2.Create, design and explore a research in a specialized area and evaluate this research with appropriate	3. Be aware of current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology .	Provide the students with current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology.	5.Designing, writing and presenting high quality dissertations and scientific papers	6.Carry out a range of advanced skills and laboratory techniques, including the purification of isolated microbial pathogens and analyses of their proteins and nucleic acids for downstream applications.	7.Have skills for diagnosis of different pathogens as well as solve their problems and make decision based on available information.	8.Develop the communication and IT skills effectively and leading the team.	9. Be aware of the postgraduate role in community development and environment protection	10. Consider continuous, self-learning and experience transfer.
	and the use of appropriate technological means to serve his/her thesis										
	c9- Carry out common experiments related to his/her thesis.		✓								
	c10- Develop plans and experimental design for performing experiments related to his/her thesis.		✓		✓						
General and	d1- Communicate effectively by all means and improve skills in written and verbal communication of complex information								✓		
	d2- Use informational technology to serve the development of professional practice.								✓		✓

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Program ILOS										
d3- Be responsible for learning and have the ability to work with and motivate others and evaluate their performance.	✓							✓		✓
d4- Achieve confidence in his/her thinking abilities and apply self-assessment and continuous learning.	✓									✓
d5- Utilize different sources of information and knowledge in the field of his/her thesis.	✓				✓			✓		
d6- Write scientific article according to the basics of scientific research to serve his/her thesis.					✓					
d7- Present research finding in oral and written from using an appropriate software (e.g.,					✓			✓		

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		Provide the students with knowledge of specialized areas of microbiology practice and having an appreciation of the current range of theoretical and research understanding in those areas.	2.Create, design and explore a research in a specialized area and evaluate this research with appropriate	3. Be aware of current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology .	Provide the students with current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of Microbiology.	5.Designing, writing and presenting high quality dissertations and scientific papers	6.Carry out a range of advanced skills and laboratory techniques, including the purification of isolated microbial pathogens and analyses of their proteins and nucleic acids for downstream applications.	7.Have skills for diagnosis of different pathogens as well as solve their problems and make decision based on available information.	8.Develop the communication and IT skills effectively and leading the team.	9. Be aware of the postgraduate role in community development and environment protection
	power point, word, excel and database).									
	d8- Work in a team and lead teams.							√		√
	D9- Manage scientific meetings and discussions as well as manage time efficiently.									√



Course specification of postgraduate

1-Basic information

Course Code:	Ph-82
Course title :	General bacteriology (advanced course)
Program title:	PhD
Contact hours/ week	3 hours per week (1 theoretical and 2 practical)
Approval Date	

2-Professional information

Overall aims of course:

This course aims that student is able to:

1. Be aware with the main characteristics of bacteria (classification, structure, growth ,nutrition, metabolism and virulence)
2. Work continuously for increasing in-depth knowledge of specialized areas of bacteriology.
3. Carry out a range of advanced skills and laboratory techniques, including the purification of isolated microbial pathogens and analyses of their proteins and nucleic acids for downstream applications.
4. Designing, writing and presenting high quality dissertations and scientific papers.
5. Utilize efficiently the available resources and improving as well as offering new resources.
6. Be aware of the postgraduate role in community development and environment protection.
7. Consider continuous, self-learning and experience transfer.

3- Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

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

- a.1 Clarify the most recent basics for classification and nomenclature of bacteria.
- a.2- conclude the historical development of Microbiology.
- a.3- Describe the nature of bacterial morphology, structures and anatomy.
- a.4- Understand growth requirements, physiology and virulence factors of different bacteria.
- a.5-Outline specialized knowledge in the field of bacteriology.
- a6-Know the genetics of bacteria.
- a.7-Conclude factors leading to bacterial resistance& virulence.
- a8- Outline principles and morals of scientific research and the bases of designing an experimental work using bacteria

b-Intellectual skills

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

- b1- Solve specialized bacteriology problems based on the data available.
- b.2- Conduct a research study and write a scientific article on a research problem in the field related to his/her thesis.
- b.3 Discuss and debate depending on proofs and evidences.



Course specification of postgraduate

b.4- Think scientifically and evaluate information critically.

C- Professional and practical skills

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

- c.1- Apply the principles of the scientific and microbiological laboratory techniques.
- c.2- Recognize microscopy-types, their principles and uses.
- c.3-Be familiar with bacteriological samples collection, transportation and preservation.
- c.4- Prepare different bacterial media under sterile condition.
- c.5-Cultivate bacteria on various types of media.
- c.6- Identify the causative microorganism depending on morphological, cultural and biochemical characters as well as serology.
- c.7 Determine the antimicrobial susceptibility of different bacteria to the antimicrobial drugs.
- c8-Apply simple and specific staining methods
- c.9- Apply molecular biology methods
- c.10-plan an experiment using bacterial isolate efficiently.

d- General and transferable skills

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

- d.1. Work in groups and manage time.
- d.2. enhance public speaking and scientific writing skills
- d.3. Properly use the information technologies for development of his/her professional abilities.
- d.4. Use different facilities for gaining knowledge and information.
- d.5. Understand the significance and means of continuous self learning.

4-Topics and contents

3 hours per week (1 theoretical and 2 practical)			
Lectures topic	No. of hours	Practical	No. of hours
<ul style="list-style-type: none"> • Classification and nomenclature of bacteria. 	2	<ul style="list-style-type: none"> • Introduction to basic bacteriology and laboratory rules. 	4
<ul style="list-style-type: none"> • Introduction to bacteriology (morphology, anatomy and structure) 	4	<ul style="list-style-type: none"> • Sampling • Sample transportation and preservation • Direct microscopic examination of samples • Dark-field microscopy • Preparation of bacterial smear 	8
<ul style="list-style-type: none"> • Bacterial sporulation. 	2	<ul style="list-style-type: none"> • Wet mount and hanging drop 	4



Course specification of postgraduate

		technique.	
<ul style="list-style-type: none"> Bacterial growth in artificial media Variation and dissociation 	2	<ul style="list-style-type: none"> Bacteriological media Identification of colonial morphology on different media 	4
<ul style="list-style-type: none"> Nutrition and metabolism of bacteria Bacterial division and cell aggregates. Sexual and asexual reproduction of Bacteria 	4	<ul style="list-style-type: none"> reliable and advanced methods of sterilization 	8
<ul style="list-style-type: none"> Exaltation and attenuation of bacterial virulence Bacterial toxins, pigments and enzymes. 	4	<ul style="list-style-type: none"> staining of bacteria 	8
<ul style="list-style-type: none"> Relationships of the bacteria to the host and environment. 	4	<ul style="list-style-type: none"> Chemical and enzymatic tests for identification of bacteria. 	8
<ul style="list-style-type: none"> Bacterial pathogenesis(infection and colonization; invasive attributes) 	4	Tests based on cellular and humeral immunity	8
<ul style="list-style-type: none"> Overview of medically important bacterial infections. 	2	<ul style="list-style-type: none"> Determination of antimicrobial susceptibility of different bacteria. 	4
<ul style="list-style-type: none"> Gene expression (Transcription and Translation). Bacterial chromosome and plasmids. Mutations and mutagenic agents. 	4	<ul style="list-style-type: none"> Methods of molecular biology. 	8
<ul style="list-style-type: none"> Koch's postulates and their exceptions 	2	<ul style="list-style-type: none"> Counting bacteria. Enumeration of coliform bacteria and colony forming unit (cfu). 	4
<ul style="list-style-type: none"> Principles of scientific research. 	2	Planning an experiment	4
Total	36		72

5-Teaching and learning methods

- 5.1- Lectures (brain storm, discussion) using board, data shows
- 5.2- Self learning by preparing essays and presentations (computer researches and library)
- 5.3- Practical (examining samples of stained bacterial films)



Course specification of postgraduate

7-Student assessment

7.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
Written Exam	a1- a2- a3- a4-a5- a6-a7-a8	b1- b2-b3-b4	c2- c3-c6-c7- c10	d1-d2
Practical Exam	a5- a8	b1-b4	c1- c2-c3-c4-c5- c6-c7-c8-c9-c10	d1-d2
Oral Exam	a1- a2- a3- a4-a5- a6-a7-a8	b1- b2-b3-b4	c2- c3-c6-c7- c10	d1-d2

7.2. Assessment schedules

Method	Week(s)
Written exam	45-48
Practical exam	45-48
Oral exam	45-48

7.3. Weight of assessments

Assessment	Weight of assessment
Written exam	50%
Practical exam	25%
Oral exam	25%
total	100%

8- List of references

8.1. Notes and books:

Departmental notes on:

8.1.1- Notes on Bacteriology, Mycology and Immunology.

8.1.2- Notes on Practical Bacteriology, Mycology and Immunology.

8.1.3- Notes on Veterinary Microbiology

8.2. Essential books:

8.2.1- Prescott, Harley and Klein's Microbiology. J. M. Willey, L. M. Sherwood, and C. J. Woolverton – 17th Edition, International Edition , 2008, Mc Graw Hill

8.2.2- Diagnostic Microbiology, 2nd Edition 2000 Connie R. Mahon and George Manuselis.

8.3. Recommended textbooks:

8.3.1- Clinical Veterinary Microbiology, P.J. Quinn, M.E. Carter, B. Markey and G.R. Carter, 6th Editio2004

8.3.2- Veterinary Microbiology, Dwight C. Hirsh and Yuan Ghung Zee, 1999



Beni-Suef University
Faculty of Veterinary Medicine

Course specification of postgraduate

8.3.3- Medical Microbiology, R. Cruickshank 1986.

8.3.4- Mackie and McCartney Medical Microbiology, 14th Edition 1992 (J. P. Duguid, B.P. Marmion and R. H. A. Swain). (The book present in the faculty library)

8.3.5- Topley & Wilson microbiology and microbial infections, 9 th edition

8.4. Journals, Websitesetc

Journal of Bacteriology

Microbiology

Microbiology and Immunology

Journal of Microbiology, Immunology and Infection

BMC Microbiology

Brazilian Journal of Microbiology

Microbiology and Molecular Biology Reviews

Internet Journal of Microbiology

Polish Journal of Microbiology

Journal of Microbiology and Biotechnology

African Journal of Microbiology Research

International Journal of Microbiology

Iranian Journal of Microbiology

Websites

<http://www.sciencedirect.com>.

<http://www.Pubmed>.

<http://www.Altavista>.

<http://www.cellsalive.com>.

<http://www.textbookofbacteriology.net>.

http://www.ourfood.com/General_bacteriology.html

<http://www.Veterinary Microbiology>

<http://www.Immunology and Immunopathology>

Course Coordinators

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Immunology, Faculty of Veterinary Medicine,
Beni-Suef University

Head of Department

Prof. Dr. Ismail Abd El-Hafeez Radwan

Professor and Head of Bacteriology, Mycology
and Immunology department, Faculty of
Veterinary Medicine, Beni-Suef University



Course specification

Course specification matrix

Topics	weeks	Intended learning outcomes of course (ILOs)			
		K&U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
<ul style="list-style-type: none"> • Classification and nomenclature of bacteria. • Introduction to basic bacteriology and laboratory rules. 	1-2	a1,a2	b4	c1	d1,d2,d3,d4,d5
<ul style="list-style-type: none"> • Introduction to bacteriology (morphology, anatomy and structure) • Sampling • Sample transportation and preservation • Direct microscopic examination of samples • Dark-field microscopy • Preparation of bacterial smear 	3-6	a2,a3	b1,b4	c1,c2,c3	d1,d2,d3,d4,d5
<ul style="list-style-type: none"> • Bacterial sporulation. • Wet mount and hanging drop technique. 	7-8	a5	b1,b4	c1	d1,d2,d3,d4,d5
<ul style="list-style-type: none"> • Bacterial growth in artificial media • Variation and dissociation • Bacteriological media • Identification of colonial morphology on different media 	9-10	a4,a5	b1,b4	c4,c5,c6	d1,d2,d3,d4,d5
<ul style="list-style-type: none"> • Nutrition and metabolism of bacteria • Bacterial division and cell aggregates. • Sexual and asexual reproduction of Bacteria • reliable and advanced methods of sterilization • 	11-14	a4,a5	b1,b3,b4	c1	d1,d2,d3,d4,d5
<ul style="list-style-type: none"> • Exaltation and attenuation of bacterial virulence 	15-18	a5,a7	b1,b3, b4	c1,c8	d1,d2,d3,d4,d5



Course specification

<ul style="list-style-type: none"> • Bacterial toxins, pigments and enzymes. • staining of bacteria 					
<ul style="list-style-type: none"> • Relationships of the bacteria to the host and environment. • Chemical and enzymatic tests for identification of bacteria. 	19-22	a5,a7	b1,b3, b4	c1,c6	d1,d2,d3,d4,d5
<ul style="list-style-type: none"> • Bacterial pathogenesis(infection and colonization; invasive attributes) • Tests based on cellular and humeral immunity 	23-26	a5,a7	b1,b3, b4	c1,c6	d1,d2,d3,d4,d5
<ul style="list-style-type: none"> • Overview of medically important bacterial infections. • Determination of antimicrobial susceptibility of different bacteria. 	27-28	a5,a7	b1,b3, b4	c7	d1,d2,d3,d4,d5
<ul style="list-style-type: none"> • Gene expression (Transcription and Translation). • Bacterial chromosome and plasmids. • Mutations and mutagenic agents. • Methods of molecular biology. 	29-32	a6	b1,b3, b4	c9	d1,d2,d3,d4,d5
<ul style="list-style-type: none"> • Koch's postulates and their exceptions • Counting bacteria. • Enumeration of coliform bacteria and colony forming unit (cfu). 	33-34	a5,a7	b1,b3, b4	C1	d1,d2,d3,d4,d5
<ul style="list-style-type: none"> • Principles of scientific research. • Planning an experiment 	35-36	a8	b2	c1,c10	d1,d2,d3,d4,d5



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Course specification of postgraduate

1-Basic information

Course Code:	Ph-83
Course title :	Farm Animal Bacteriology
Program title:	Ph.D. of Animal Microbiology (Ph-MICR)
Contact hours/ week	5 hr/week (2hr theoretical and 3hr practical).
Approval Date	

2-Professional information

Overall aims of course:

This course aims to:

1. Work continuously to develop his/her knowledge in the field of bacterial diseases affecting poultry and rabbits.
2. Show awareness of the ongoing problems and visions in the modern area of Microbiology of farm animals
3. Identify problems and find professional solutions.
4. Decision-making in different professional contexts.
5. Communicate effectively and the ability to lead teams.

3- Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

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

- a.1. Employ the acquired knowledge about the bacterial classification, nature and structure of bacterial cells in relation to their functions.
- a.2. Recognize the optimal requirements for the growth and reproduction.
- a.3. Enumerate the factors associated with the virulence of the microorganisms, its exaltation and attenuation.
- a.4. Enumerate the by-products of pathogenic microorganisms.
- a.5. Conclude factors leading to bacterial resistance & virulence.
- a.6. Describe how genetic characters of bacteria could be expressed, transferred and changed.
- a.7. Recall information about bacterial diseases of farm animals.
- a.8. Outline recent specialized knowledge in the field of bacterial diseases and related sciences.
- a.9. Outline principles and morals of scientific research and the bases of designing an experimental work using bacterial isolate.
- a.10. List the extensively updated immunologic laboratory tests and advanced methods aid in rapid clinical diagnosis of bacterial diseases of farm animals.

b- Intellectual skills:

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

- b.1. Analyze and evaluate knowledge related to diagnosis, prevention and control of bacterial diseases of farm animals and interpret it to solve the related problems.
- b.2. Assess the infective potential of environmental materials to control the infection in the community.



Course specification of postgraduate

- b.3. Suggest the solutions of the problems concerning with different veterinary bacterial affections in farm animals.
- b.4. Write and evaluate scientific papers.
- b.5. Accept Innovation and creativity.
- b.6. Discuss and debate others using different facts and data.

c- Professional and practical skills

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

- c.1. Master different conventional and advanced skills and techniques used in diagnosis, prevention and control of bacterial diseases in farm animals.
- c.2. Assess different available tools and methods applied in diagnosis of bacterial diseases in farm animals.
- c.3. Collect the suitable specimens at the suitable time from farm animals for bacteriological examination.
- c.4. Recognize the precautions and handling for each sample.
- c.5. Identify the causative microorganism depending on morphological, cultural and biochemical characters as well as serology and molecular techniques.
- c.6. Determine the sensitivities of infected organism to antimicrobial drugs.
- c.7. Properly use the suitable technologies to serve of his/her professional practices.
- c.8. Enhance the performance of others through proper planning.

d- General and transferable skills

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

- d.1. Work in a team work and manage time.
- d.2. Communicate effectively using different means.
- d.3. Properly use the information technologies for development of his/her professional abilities.
- d.4. Use different facilities for gaining knowledge and information.
- d.5. Understand the significance and means of continuous self learning.
- d.6. Manage scientific meetings and conferences.

4-Topics and contents

Topic	No. of hours	Practical	No. of hours
–General bacteriology	12	Microscopes and microscopic examination. Sterilization	18
–molecular biology and bacterial genetics	12	Methods of molecular biology.	18
Gram positive bacteria affecting farm animals and their antimicrobial susceptibility.	12	Simple stains Differential stains.	18
Gram negative bacteria affecting farm animals and their antimicrobial susceptibility.	12	Bacterial motility Bacteriological media	18



Course specification of postgraduate

Differential diagnosis of Bacteria causing respiratory manifestations in farm animals	4	Sampling and sample preparation	6
Differential diagnosis of Bacteria causing diarrhea in farm animals	4	Cultivation of aerobic and anaerobic bacteria	6
Differential diagnosis of Bacteria causing mastitis in farm animals	4	Purification of bacterial culture	6
Differential diagnosis of Bacteria causing abortion in farm animals	4	Biochemical identification of bacteria	6
- Principles of scientific research and the bases of designing an experimental work using bacterial isolate.	4	Disk diffusion test and minimal inhibitory concentration	6
- Bases of writing a thesis and research plan	4	serodiagnosis	6
	72		108

5-Teaching and learning methods

5.1- Lectures (brain storming, discussion) using board and data shows.

5.2- Self learning Electronic learning, Presentations, Essays or Seminars by scientific search on related websites, international, national and local journals, related books in faculty library.

5.3- Practical sections.

- Microscopical and colonial examination of different bacteria.
- Biochemical tests for identification of different bacteria.
- Advanced immunological and serological tests for identification of bacteria.

6-Student assessment

6.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
written Exam	a1 to a10 (all)	b1 to b6 (all)	c1, c2, c3,c4,c7	d5
Practical Exam	a2, a9, a10		c1 to c5	
Oral Exam	a1 to a10 (all)	b1 to b6 (all)	c1 to c7	

6.2. Assessment schedules

Method	Week(s)
Practical exam	45-48
written Exam	45-48
Oral Exam	45-48

6.3. Weight of assessments

Assessment	Weight of assessment
written Exam	50%
Practical exam	25%
Oral exam	25%



Course specification of postgraduate

Total	100%
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7- List of references

7.1. Notes and books

Departmental notes on:

- 7.1.1- Notes on Bacteriology, Mycology and Immunology.
- 7.1.2- Notes on Practical Bacteriology, Mycology and Immunology.
- 7.1.3- Notes on Veterinary Microbiology.

7.2. Essential books:

- 7.2.1- Bergey's Manual of Systematic Bacteriology, 4th Edition Noel R. Krieg, John G. Holt, and Murray R. G. E. 1984.
- 7.2.2- Prescott, Harley and Klein's Microbiology. J. M. Willey, L. M. Sherwood, and C. J. Woolverton – 17th Edition, International Edition , 2008, Mc Graw Hill
- 7.2.3- Bergey's Manual of Determinative Bacteriology, 9th Edition John G. Holt, 1993
- 7.2.4- Diagnostic Microbiology, 2nd Edition 2000 Connie R. Mahon and George Manuselis.

7.3. Recommended text books:

- 7.3.1- Clinical Veterinary Microbiology, P.J. Quinn, M.E. Carter, B. Markey and G.R. Carter, 6th Editio2004
- 7.3.2- Veterinary Microbiology, Dwight C. Hirsh and Yuan Ghung Zee, 1999
- 7.3.3- Medical Microbiology, R. Cruickshank 1986.
- 7.3.4- Mackie and McCartney Medical Microbiology, 14th Edition 1992 (J. P. Duguid, B.P. Marmion and R. H. A. Swain). (The bock present in the faculty library)
- 7.3.5- Medical Mycology, 1992 K. J. Kwon-Chung and John E. Bennett.
- 7.3.6- Introductory Mycology, 3rd Edition 1979, C.J. Alexopoulos and C.W. Mims.
- 7.3.7- Immunology, 1986 D. M. Weir.
- 7.3.8- Medical Immunology, 1977, Malcolm S. Thaler, M. D. and Richard D.
- 7.3.9- Topley & Wilson microbiology and microbial infections, 9 th edition

7.4. Journals, Websitesetc

- [Journal of Bacteriology](#)
- [Microbiology](#)
- [Microbiology and Immunology](#)
- [Journal of Microbiology, Immunology and Infection](#)
- [BMC Microbiology](#)
- [Brazilian Journal of Microbiology](#)
- [Microbiology and Molecular Biology Reviews](#)
- [Internet Journal of Microbiology](#)
- [Polish Journal of Microbiology](#)



Beni-Suef University
Faculty of Veterinary Medicine



Course specification of postgraduate

[Journal of Microbiology and Biotechnology](#)

[African Journal of Microbiology Research](#)

[International Journal of Microbiology](#)

[Iranian Journal of Microbiology](#)

Websites

<http://www.sciencedirect.com>.

<http://www.Pubmed>.

<http://www.Altavista>.

<http://www.cellsalive.com>.

<http://www.textbookofbacteriology.net>.

http://www.ourfood.com/General_bacteriology.html

<http://www.Veterinary Microbiology>

<http://www.Immunology and Immunopathology>

Course Coordinator

Dr. Hala Sayed Hassan

Ass. Prof. of Bacteriology, Mycology and Immunology, Faculty of Veterinary Medicine, Beni-Suef University

Head of the department

Prof. Dr. Ismail Abd El-Hafeez Radwan

Professor and Head of Bacteriology, Mycology and Immunology department, Faculty of Veterinary Medicine, Beni-Suef University



Course specification of postgraduate

Course specification Matrix

Topic	weeks	Intended learning outcomes of course (ILOs)			
		K&U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
<ul style="list-style-type: none"> • General bacteriology • Microscopes and microscopic examination. • Sterilization 	12	a1,a2,a3,a4,a5	b1,b2	c1,c2	d1to d6 (all)
<ul style="list-style-type: none"> • molecular biology and bacterial genetics • Methods of molecular biology. 	12	a6	b5	c1,c2	d1to d6 (all)
<ul style="list-style-type: none"> • Gram positive bacteria affecting farm animals and their antimicrobial susceptibility. • Simple stains. • Differential stains. 	12	a7,a8,a9,a10	b1,b2,b3,b5,b6	c1,c2	d1to d6 (all)
<ul style="list-style-type: none"> • Gram negative bacteria affecting farm animals and their antimicrobial susceptibility. • Bacterial motility. • Bacteriological media. 	12	a7,a8,a9,a10	b1,b2,b3,b5,b6	c1 to c6 (all)	d1to d6 (all)
<ul style="list-style-type: none"> • Differential diagnosis of Bacteria causing respiratory manifestations in farm animals • Sampling and sample preparation 	4	a7,a8,a9,a10	b1,b2,b3,b5,b6	c1 to c6 (all)	d1to d6 (all)
<ul style="list-style-type: none"> • Differential diagnosis of Bacteria causing diarrhea in farm animals. • Cultivation of aerobic and anaerobic bacteria. 	4	a7,a8,a9,a10	b1,b2,b3,b5,b6	c1 to c6 (all)	d1to d6 (all)



Course specification of postgraduate

<ul style="list-style-type: none">Differential diagnosis of Bacteria causing mastitis in farm animalsPurification of bacterial culture	4	a7,a8,a9,a10	b1,b2,b3,b5,b6	c1 to c6 (all)	d1to d6 (all)
<ul style="list-style-type: none">Differential diagnosis of Bacteria causing abortion in farm animalsBiochemical identification of bacteria	4	a7,a8,a9,a10	b1,b2,b3,b5,b6	c1 to c6 (all)	d1to d6 (all)
<ul style="list-style-type: none">Principles of scientific research and the bases of designing an experimental work using bacterial isolate.Disk diffusion test and minimal inhibitory concentration	4	a9,a10	b3	c1 to c6 (all)	d1to d6 (all)
<ul style="list-style-type: none">Bases of writing a thesis and research planSerodiagnosis	4	a9,a10	b4	c4	d1to d6 (all)



Course specification of postgraduate

1-Basic information

Course Code:	Ph-84
Course title :	Advanced bacteriology of poultry and rabbits
Program title:	PhD
Contact hours/ week	4 hours per week (2 theoretical and 2 practical)
Approval Date	

2-Professional information

Overall aims of course:

This course aims that student is able to:

1. Work continuously to develop his/her knowledge in the field of bacterial diseases affecting poultry and rabbits.
2. Show awareness of the ongoing problems and visions in the modern area of Microbiology of poultry.
3. Identify problems and find professional solutions.
4. Decision-making in different professional contexts.
5. Communicate effectively and the ability to lead teams.

3- Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

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

- a.1. Define recent theories and knowledge in the field of bacterial diseases of poultry and related sciences.
- a.2. Outline principles of scientific research in the field of bacterial diseases of poultry.
- a.3. Recall information about bacterial diseases of poultry and their pathogenesis and interaction with other diseases.
- a.4. Outline specialized theories and knowledge in the field of bacterial diseases of poultry and related sciences.
- a.5. Outline principles and morals of scientific research and the bases of designing an experimental work using bacterial isolate.

b-Intellectual skills:

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

- b.1. Analyze and evaluate information in the field of bacteriology for poultry and rabbits and analogies to solve problems.
- b.2. Plan and implement research studies add to knowledge.
- b.3. Discuss and debate others using different facts and data.
- b.4. Asses' different risk factors for each practice related to poultry industry.

c- Professional and practical skills:

- c.1. Master different conventional and advanced skills and techniques used in diagnosis, prevention and control of bacterial diseases of poultry and rabbits.
- c.2. Assess different available tools and methods applied in diagnosis of bacterial diseases of poultry and rabbits.
- c.3. Suggest the solutions of the problems concerning with bacterial diseases of poultry and



Course specification of postgraduate

rabbits.

c.4. Accept Innovation and creativity.

c.5. Properly use the suitable technologies to serve of his/her professional practices.

d- General and transferable skills:

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

d.1. Communicate effectively using different means.

d.2. Properly use the information technologies for development of his/her professional abilities.

d.3. Assess him/herself and learn how to detect his/her learning requirements.

d.4. Use different facilities for gaining knowledge and information.

d.5. Understand the significance and means of continuous self learning.

d.6. Create rules and indicators for evaluation of the performance of others.

Properly use the suitable technologies to serve of his/her professional practices.

4-Topics and contents

Course	Topic	No. of hours	Practical	No. of hours
Poultry and rabbit diseases (Lec. 2h./week, Pract 2h./week)	General bacteriology (morphology, anatomy and virulence factors, bacterial growth and nutrition) Bacterial pathogenesis	12	Microscopy Sterilization and disinfection	12
	Bacterial chromosome and plasmids. Mutations and mutagenic agents.	8	Bacterial motility	8
	Genus Staphylococcus Genus Streptococcus	8	Bacteriological media	8
	Clostridia spp. affecting poultry and rabbits Tubercule bacilli affecting poultry and rabbits	12	Bacterial staining	12
	E. coli and Salmonella Genus Pseudomonas Haemophilus spp. Campylobacter spp.	12	Sampling and sample preparation Isolation of bacteria	12
	Genus Mycoplasma	4	Biochemical identification of bacteria	4
	Bordetella spp. Chlamydia	8	Serological diagnosis	8
	Spirochaetes	8	Antimicrobial susceptibility testing of different bacteria.	8
	Total	72		72

5-Teaching and learning methods

5.1. Lectures: Depend on the sharing efforts of the students and supported with macromedia and multimedia aids.

5.2. Practical sections:

- Clinical and necropsy examination of diseased and dead samples.



Course specification of postgraduate

- Laboratory diagnosis of different poultry and rabbit diseases using suitable methods.
 - Antimicrobial sensitivity testing.
- 5.3. Self-learning: Electronic learning, Seminars, scientific search on related websites, international, national and local journals, and related books in faculty library.
- 5.4. Assays and reviews
- 5.5. Discussion groups.

6-Student assessment

6.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
Writing exam	a1- a2- a3-a4	b1- b2- b3-b4	c3- c4	-
Practical exam	-	b1	c1- c2- c3- c5	-
Oral exam	a1- a2- a3- a4	b1- b2- b3-b4	c3- c4	-

6.2. Assessment schedules

Method	Week(s)
Writing exam	45-48
Practical exam	45-48
Oral exam	45-48

6.3. Weight of assessments

Assessment	Weight of assessment
Writing exam	50%
Practical exam	25%
Oral exam	25%
Total	100%

7- List of references

7.1. Notes and books:

Departmental notes on:

- 7.1.1- Notes on Bacteriology, Mycology and Immunology.
- 7.1.2- Notes on Practical Bacteriology, Mycology and Immunology.
- 7.1.3- Notes on Veterinary Microbiology

7.2. Essential books:

- 7.2.1- Prescott, Harley and Klein's Microbiology. J. M. Willey, L. M. Sherwood, and C. J. Woolverton – 17th Edition, International Edition , 2008, Mc Graw Hill
- 7.2.2- Diagnostic Microbiology, 2nd Edition 2000 Connie R. Mahon and George Manuselis.



Beni-Suef University
Faculty of Veterinary Medicine

Course specification of postgraduate

7.3. Recommended textbooks:

7.3.1- Clinical Veterinary Microbiology, P.J. Quinn, M.E. Carter, B. Markey and G.R. Carter, 6th Edition 2004

7.3.2- Veterinary Microbiology, Dwight C. Hirsh and Yuan Ghung Zee, 1999

7.3.3- Medical Microbiology, R. Cruickshank 1986.

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<http://www.cellsalive.com>.

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http://www.Immunology_and_Immunopathology

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Immunology department, Faculty of Veterinary
Medicine, Beni-Suef University



Course specification of postgraduate

Course	Topic	Intended learning outcomes of course (ILOs)				
		weeks	K&U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
Poultry and rabbit diseases (Lec. 2h./week, Pract 2h./week)	<ul style="list-style-type: none"> • General bacteriology (morphology, anatomy and virulence factors, bacterial growth and nutrition) • Bacterial pathogenesis • Microscopy • Sterilization and disinfection 	1-6	a3	b2	c1	d1-d6
	<ul style="list-style-type: none"> • Bacterial chromosome and plasmids. • Mutations and mutagenic agents. • Bacterial motility 	7-10	a1	b2	c1	d1-d6
	<ul style="list-style-type: none"> • Genus Staphylococcus • Genus Streptococcus • Bacteriological media 	11-14	a1-a5	c1-b4	c1-c4	d1-d6
	<ul style="list-style-type: none"> • Clostridia spp. affecting poultry and rabbits • Tubercule bacilli affecting poultry and rabbits • Bacterial staining 	15-20	a1-a5	c1-b4	c1-c4	d1-d6
	<ul style="list-style-type: none"> • E. coli and Salmonella • Genus Pseudomonus • Haemophilus spp. • Campylobacter spp. • Sampling and sample preparation • Isolation of bacteria 	21-26	a1-a5	c1-b4	c1-c4	d1-d6
	<ul style="list-style-type: none"> • Genus Mycoplasma • Biochemical identification of bacteria 	27-28	a1-a5	c1-b4	c1-c4	d1-d6
	<ul style="list-style-type: none"> • Bordetella spp. • Chlamydia • Serological diagnosis 	29-32	a1-a5	c1-b4	c1-c4	d1-d6
	<ul style="list-style-type: none"> • Spirochaetes • Antimicrobial susceptibility testing of different bacteria. 	33-36	a1-a5	c1-b4	c1-c4	d1-d6



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Course specification of postgraduate

1-Basic information

Course Code:	Ph-85
Course title :	Bacteriology of fish
Program title:	PhD
Contact hours/ week	3 hours per week (1 theoretical and 2 practical)
Approval Date	

2-Professional information

Overall aims of course:

This course aims to:

1. Work continuously for increasing in-depth knowledge of bacterial diseases of fishes and having an appreciation of the current range of theoretical and research understanding in those areas.
2. Master the various methods of data collection and application of analytical and critical approach in bacterial diseases of fishes.
3. Create, design and explore a research in fish microbiology and evaluate this research with appropriate.
4. Develop the appropriate use of modern research techniques and applications used in fish microbiology for mastering a wide range of professional skills.
5. Designing, writing and presenting high quality dissertations and scientific papers.
6. Carry out a range of advanced skills and laboratory techniques, including the purification of isolated microbial pathogens from fishes and analyses of their proteins and nucleic acids for downstream applications.
7. Have skills for diagnosis of different fish pathogens as well as solve their problems and make decision based on available information.
8. Consider continuous, self-learning and experience transfer.
9. Plan and steer the progress of research projects.

3- Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

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

- a1- Acquire up to date concepts and in-depth knowledge in bacteria and fungi associated with fish diseases.
- a2- Perceive the current theories and advanced fish microbiology scientific researches.
- a3- Diagnose and identify different bacteria and fungi causing diseases in fishes.
- a4- Apply the advanced research techniques used in fish microbiology.
- a5- Apply recent molecular biology techniques in research.
- a6- Sustain quality control measures in fish microbiology practices and acquire the knowledge and understanding required for protecting environment from microbial infections and planning the infection management policy.
- a7- Apply the specialized knowledge and combine it with relevant knowledge in



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the field of his/her thesis.

b-Intellectual skills:

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

- b.1. Analyze, evaluate and interpret scientific fish microbiology knowledge autonomously using integrated approaches and accurately assess and criticize the applied researches for standardization and conclusion.
- b.2. Solve specialized fish microbiology problems based on the data available.
- b.3. Diagnose and differentiate between different bacterial and fungal diseases of fish.
- b.4. Recognize the ethical constraints associated with the subject area and the ability to relate these to his/her experience.
- b.5. Conduct a research study and write a scientific article on a research problem in the field related to his/her thesis.
- b.6. Make decision based on available information in different professional contexts.
- b.7. Dialogue and discussion based on proofs and evidences.

c- Professional and practical skills:

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

- c.1. Master the basic and modern professional practical skills relevant to fish microbiology and achieve a high efficiency in laboratory skills.
- c.2. Manage and handle the different infected specimens safely from fishes and work in accordance with safety rules in a microbiology laboratory.
- c.3. Perform the different biochemical, serological and molecular techniques and apply different bacterial virulence tests used for lab diagnosis of microbial infections.
- c.4. Write and assess professional reports in fish microbiology.
- c.5. Evaluate and improve the available and required material, methods, tools and equipment in fish Microbiology research.
- c.6. Use the advanced skills in fish microbiology research methodologies and techniques.
- c.7. Explain the basic genetic properties of microorganism and evaluate the effects of these properties to disease formation.
- c.8. Master an appropriate range of basic and modern professional skills, and the use of appropriate technological means to serve his/her thesis.
- c.9. Develop plans and experimental design for performing experiments related to his/her thesis.

d- General and transferable skills:

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

- d.1. Communicate effectively by all means and improve skills in written and verbal communication of complex information
- d.2. Use informational technology to serve the development of professional practice.
- d.3. Be responsible for learning and have the ability to work with and motivate others and



Course specification of postgraduate

evaluate their performance.

- d.4. Achieve confidence in his/her thinking abilities and apply self-assessment and continuous learning.
- d.5. Utilize different sources of information and knowledge in the field of his/her thesis.
- d.6. Write scientific article according to the basics of scientific research to serve his/her thesis.
- d.7. Present research finding in oral and written form using appropriate software (e.g. power point, word, excel and database).
- d.8. Work in a team and lead teams.
- d.9. Manage scientific meetings and discussions as well as manage time efficiently.

4-Topics and contents

Course	Week	Topic (theoretical)	Hours	Practical topic	Hours
Bacteriology of fish (Lec. 1h./week, Pract 2h./week)	1	- Introduction & History of Microbiology	1	- Handling of fish samples - Microscopy, Bacterial morphology & Micrometry	8
	2-6	- General bacteriology (morphology, anatomy, growth and nutrition)	5		8
	7-8	- Bacterial Products & virulence	2		
	9-12	- Molecular characters of Bacteria	4	- Isolation of bacteria	8
	13-15	- Gram positive cocci affecting fishes; <i>Staphylococcus epidermidis</i> – <i>Streptococcus</i> spp.	3	- Serialization & disinfection	6
	16-18	Anaerobic pathogens affecting fishes; <i>Clostridium botulinum</i> , <i>Eubacterium tarantellus</i>	3	- Staining of bacteria	6
	19-21	Enterobacteria affecting fishes: <i>Edwardsiella ictaluri</i> – <i>E. tarda</i> – <i>Yersinia ruckeri</i>	3	- Bacterial culture media - Purification of bacteria	6
	22-24	Vibrios: <i>V. anguillarum</i> (<i>Listonella anguillarum</i>) – <i>V. damsela</i> – <i>V. ordalii</i> <i>V. vulnificus</i>	3	- Biochemical identification of bacteria	6
	25-26	Gram negative pigmented rods characterization of the disease conditions	2	- Serological identification of bacteria - Chemotherapy - Molecular techniques	6
	27-28	Pseudomonads : <i>P. anguilliseptica</i> – <i>P. fluorescens</i>	2		6
	29-32	Mycotic affections of fishes	4		8
	33-34	Bases of writing a thesis and research plan	2		
	Total		34		68

5-Teaching and learning methods

- 5.1. Lectures: Depend on the sharing efforts of the students and supported with macromedia and multimedia aids.
- 5.2. Practical sections:
 - Clinical and necropsy examination of diseased and dead samples.
 - Laboratory diagnosis of different fish diseases using suitable methods.
 - Antimicrobial sensitivity testing.
- 5.3. Self-learning: Electronic learning, Seminars, scientific search on related websites, international,



Course specification of postgraduate

national and local journals, and related books in faculty library.

5.4. Assays and reviews

5.5. Discussion groups.

6-Student assessment

6.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
Writing Exam	a1,a2,a3,a4,a5,a6	b1,b2,b3,b4,b5	c1,c7,c8	d4,d5,d6
Practical Exam	a3,a4,a5,a6	b1,b2,b3,b6	c1,c2,c3,c4,c5,c6,c9	d2, d4
Oral Exam	a1,a2,a3,a4,a5,a6,a7	b1,b2,b3,b4,b5,b7	c1,c7,c8	d4,d5,d6,d7,d9

6.2. Assessment schedules

Method	Week(s)
Writing exam	45-48
Practical exam	45-48
Oral exam	45-48

6.3. Weight of assessments

Assessment	Weight of assessment
Writing exam	50%
Practical exam	25%
Oral exam	25%
Total	100%

7- List of references

7.1. Notes and books:

Departmental notes on:

7.1.1- Notes on Bacteriology, Mycology and Immunology.

7.1.2- Notes on Practical Bacteriology, Mycology and Immunology.

7.1.3- Notes on Veterinary Microbiology

7.2. Essential books:

7.2.1- Prescott, Harley and Klein's Microbiology. J. M. Willey, L. M. Sherwood, and C. J. Woolverton – 17th Edition, International Edition , 2008, Mc Graw Hill

7.2.2- Diagnostic Microbiology, 2nd Edition 2000 Connie R. Mahon and George Manuselis.

7.2.3. Bacterial Fish Pathogens Diseases of Farmed and Wild Fish. 4th E.BrianAustin and Dawn Austin;Praxis Publishing, Chichester, UK 2007

7.2.4. Fish Diseases and Disorders Volume 3 Viral, Bacterial and Fungal Infections. P.T.K. Woo and D.W. Bruo. CABI Publishing Suite New York , USA 1998.

7.3. Recommended textbooks:



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7.3.1- Clinical Veterinary Microbiology, P.J. Quinn, M.E. Carter, B. Markey and G.R. Carter, 6th Edition 2004

7.3.2- Veterinary Microbiology, Dwight C. Hirsh and Yuan Ghung Zee, 1999

7.3.3- Medical Microbiology, R. Cruickshank 1986.

7.3.4- Mackie and McCartney Medical Microbiology, 14th Edition 1992 (J. P. Duguid, B.P. Marmion and R. H. A. Swain). (The book present in the faculty library)

7.3.5- Topley & Wilson microbiology and microbial infections, 9th edition

7.4. Journals, Websitesetc

[Journal of Bacteriology](#)

[Microbiology](#)

[Microbiology and Immunology](#)

[Journal of Microbiology, Immunology and Infection](#)

[BMC Microbiology](#)

[Brazilian Journal of Microbiology](#)

[Microbiology and Molecular Biology Reviews](#)

[Internet Journal of Microbiology](#)

[Polish Journal of Microbiology](#)

[Journal of Microbiology and Biotechnology](#)

[African Journal of Microbiology Research](#)

[International Journal of Microbiology](#)

[Iranian Journal of Microbiology](#)

Websites

<http://www.sciencedirect.com>.

<http://www.Pubmed>.

<http://www.Altavista>.

<http://www.cellsalive.com>.

<http://www.textbookofbacteriology.net>.

http://www.ourfood.com/General_bacteriology.html

http://www.Veterinary_Microbiology

http://www.Immunology_and_Immunopathology

Course Coordinators

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Head of Department

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Professor and Head of Bacteriology, Mycology and
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Course specification Matrix

Topic	Week		Intended learning outcomes of course (ILOs)			
			K&U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
*Introduction & History of Microbiology * General bacteriology (morphology, anatomy, growth and nutrition) *Bacterial Products & virulence	1	1-8	a1,a2	b1,b2,a7	c1	d1-d5& d7-d9
	2-6					
	7-8					
- Handling of fish samples - Microscopy, Bacterial morphology & Micrometry			a3,a4	b1,b2	c1,c2	d2,d4
* Molecular characters of Bacteria	9-12		a3,a4,a5	b1,b2,b3,a7	c7	d1-d5& d7-d9
- Isolation of bacteria			a3,a4	b1,b2,b3	c2,c3,c4,c5,c6	
*Gram positive cocci affecting fishes; <i>Staphylococcus epidermidis</i> & <i>Streptococcus</i> spp.	13-15		a1-a6	b1,b2,b3,a7	c1,c7	d1-d5& d7-d9
- Serialization & disinfection			a6	b2	c4,c5	d2,d4
* Anaerobic pathogens affecting fishes; <i>Clostridium botulinum</i> , <i>Eubacterium tarantellus</i>	16-18		a1-a6	b1,b2,b3,a7	c1,c7	d1-d5& d7-d9
- Staining of bacteria			a3,a4	b1,b2,b3	c2,c3,c4,c5,c6	d2,d4
* Enterobacteria affecting fishes: <i>Edwardsiella ictaluri</i> – <i>E. tarda</i> – <i>Yersinia ruckeri</i>	19-21		a1-a6	b1,b2,b3,a7	c1,c7	d1-d5& d7-d9
- Bacterial culture media - Purification of bacteria			a3,a4	b1,b2,b3	c2,c3,c4,c5,c6	d2,d4
* <i>Vibrios</i> : <i>V. anguillarum</i> (<i>Listonella anguillarum</i>) – <i>V. damsela</i> – <i>V. ordalii</i> <i>V. vulnificus</i>	22-24		a1-a6	b1,b2,b3,a7	c1,c7	d1-d5& d7-d9
- Biochemical identification of bacteria			a3,a4	b1,b2,b3	c2,c3,c4,c5,c6	d2,d4
* Gram negative pigmented rods characterization of the disease conditions	25-26	25-34	a1-a6	b1,b2,b3,a7	c1,c7	d1-d5& d7-d9
*Pseudomonads : <i>P. anguilliseptica</i> – <i>P. fluorescens</i>	27-28					
*Mycotic affections of fishes	29-32					
*Bases of writing a thesis and research plan	33-34					
-Serological identification of bacteria - Antimicrobial susceptibility - Molecular techniques	25-34		a3,a4 a6 a3,a4,a5	b1,b2,b3	c2,c3,c4,c5,c6	d2,d4



Course specification of postgraduate

1-Basic information

Course Code:	Ph-86
Course title :	Bacteriology of invertebrates
Program title:	PhD
Contact hours/ week	3 hr/week (1hr theoretical and 2hr practical).
Approval Date	

2-Professional information

Overall aims of course:

This course aims to:

1. Work continuously for increasing in-depth knowledge of nature, classification and microbiology of invertebrates and having an appreciation of the current range of theoretical and research understanding in those areas.
2. Master the various methods of data collection and application of analytical and critical approach in invertebrates' microbiology.
3. Create, design and explore a research in invertebrates' microbiology and evaluate this research with appropriate.
4. Develop the appropriate use of modern research techniques and applications used in invertebrates' microbiology for mastering a wide range of professional skills.
5. Designing, writing and presenting high quality dissertations and scientific papers.
6. Carry out a range of advanced skills and laboratory techniques, including the purification of isolated microbial pathogens from invertebrates and analyses of their proteins and nucleic acids for downstream applications.
7. Have skills for diagnosis of different pathogens affecting invertebrates as well as solve their problems and make decision based on available information.
8. Develop the communication and IT skills effectively and leading the team.
9. Utilize efficiently the available resources and improving as well as offering new resources.
10. Consider continuous, self-learning and experience transfer.
11. Designing the experimental work using the bacterial isolates and writing scientific paper.

3- Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

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

- a.1. Acquire up to date concepts and in-depth knowledge in invertebrates as well as bacteria and fungi associated with invertebrates diseases.
- a.2. Perceive the current theories and advanced invertebrates' microbiology scientific researches.
- a.3. Diagnose and identify different bacteria and fungi of invertebrates and their zoonotic importance.



Course specification of postgraduate

- a.4. Apply the advanced research techniques used in the invertebrates' microbiology field.
- a.5. Apply recent molecular biology techniques in research.
- a.6. Sustain quality control measures in invertebrates' microbiology practices and acquire the knowledge and understanding required for protecting environment from microbial infections and planning the infection management policy.
- a.7. Apply the specialized knowledge and combine it with relevant information in the field of his/her thesis.

b- Intellectual skills:

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

- b.1. Analyze, evaluate and interpret scientific invertebrates' microbiology knowledge autonomously using integrated approaches and accurately assess and criticize the applied researches for standardization and conclusion.
- b.2. Solve specialized invertebrates' microbiology problems based on the data available.
- b.3. Diagnose and differentiate between different bacterial and fungal diseases of invertebrates.
- b.4. Recognize the ethical constraints associated with the subject area and the ability to relate these to his/her experience.
- b.5. Conduct a research study and write a scientific article on a research problem in the field related to his/her thesis.
- b.6. Make decision based on available information in different professional contexts.
- b.7. Dialogue and discussion based on proofs and evidences.

c- Professional and practical skills

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

- c.1. Master the basic and modern professional practical skills relevant to invertebrates' microbiology and achieve a high efficiency in laboratory skills.
- c.2. Manage and handle the different infected specimens safely from invertebrates and work in accordance with safety rules in a microbiology laboratory.
- c.3. Perform the different biochemical, serological and molecular techniques and apply different bacterial virulence tests used for lab diagnosis of microbial infections.
- c.4. Write and assess professional reports in invertebrates' microbiology.
- c.5. Evaluate and improve the available and required material, methods, tools and equipment in invertebrates' microbiology research.
- c.6. Use the advanced skills in invertebrates' microbiology research methodologies and techniques.
- c.7. Explain the basic genetic properties of microorganism and evaluate the effects of these properties to disease formation.
- c.8. Master an appropriate range of basic and modern professional skills, and the use of appropriate technological means to serve his/her thesis.
- c.9. Develop plans and experimental design for performing experiments related to his/her thesis.



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d- General and transferable skills

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

- d.1. Communicate effectively by all means and improve skills in written and verbal communication of complex information
- d.2. Use informational technology to serve the development of professional practice.
- d.3. Be responsible for learning and have the ability to work with and motivate others and evaluate their performance.
- d.4. Achieve confidence in his/her thinking abilities and apply self-assessment and continuous learning.
- d.5. Utilize different sources of information and knowledge in the field of his/her thesis.
- d.6. Write scientific article according to the basics of scientific research to serve his/her thesis.
- d.7. Present research finding in oral and written form using appropriate software (e.g. power point, word, excel and database).
- d.8. Work in a team and lead teams.
- d.9. Manage scientific meetings and discussions as well as manage time efficiently.

4-Topics and contents

Course	Week	Topic (theoretical)	Hours	Practical topic	Hours
Bacteriology of invertebrates (Lec. 1h./week, Pract 2h./week)	1-5	-General bacteriology & Molecular biology	5	- Handling of invertebrates samples. - Microscopy, Bacterial morphology & Micrometry	6 4
	6-8	- Introduction to invertebrates and invertebrates' Microbiology	3	- Serialization & disinfection	6
	9-11	- Zoonotic disease transmitted by invertebrates.	3	- Staining of bacteria	6
	12-15	- Bacteria and fungi of Arthropods.	4	- Isolation of bacteria	8
	16-19	- Bacteria and fungi of Crustaceans.	4	- Bacterial culture media - Purification of bacteria	8
	20-23	- Bacteria and fungi of Mollusca.	4	- Biochemical identification of bacteria	8
	24-27	- Bacteria and fungi of Helminthes.	4	- Serological identification of bacteria	8
	28-29	- Control of bacterial disease of invertebrates	2	- Molecular techniques	4
30-32	- Principles of scientific research and the bases of designing an experimental work. - Bases of writing a thesis and research plan	3	- Chemotherapy	6	
Total			32		64

5-Teaching and learning methods

5.1- Lectures (brain storming, discussion) using board and data shows.

5.2- Self learning Electronic learning, Presentations, Essays or Seminars by scientific search on related websites, international, national and local journals, related books in faculty library.

5.3- Practical sections.

- Microscopical and colonial examination of different bacterial isolates.



Course specification of postgraduate

- Biochemical tests for identification of different bacteria.
- Immunological and serological tests for identification of bacteria.

5.4- Field visits.

6-Student assessment

6.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
Writing Exam	a1,a2,a3,a4,a5,a6	b1,b2,b3,b4,b5	c1,c7,c8	d4,d5,d6
Practical Exam	a3,a4,a5,a6	b1,b2,b3,b6	c1,c2,c3,c4,c5,c6,c9	d2, d4
Oral Exam	a1,a2,a3,a4,a5,a6,a7	b1,b2,b3,b4,b5,b7	c1,c7,c8	d4,d5,d6,d7,d9

6.2. Assessment schedules

Method	Week(s)
Practical exam	45-48
writing exam	45-48
Oral Exam	45-48

6.3. Weight of assessments

Assessment	Weight of assessment
Writing exam	50%
Practical exam	25%
Oral exam	25%
Total	100%

7- List of references

7.1. Notes and books

Departmental notes on:

- 7.1.1- Notes on Bacteriology, Mycology and Immunology.
- 7.1.2- Notes on Practical Bacteriology, Mycology and Immunology.
- 7.1.3- Notes on Veterinary Microbiology.

7.2. Essential books:

- 7.2.1- Fish diseases & disorders, 1st Edition, (Edited by P.T.K woo) published by CAB international 1999, ISBN 0851991947
- 7.2.2- Prescott, Harley and Klein's Microbiology. J. M. Willey, L. M. Sherwood, and C. J. Woolverton – 17th Edition, International Edition, 2008, Mc Graw Hill
- 7.2.3- Diagnostic Microbiology, 2nd Edition 2000 Connie R. Mahon and George Manuselis.

7.3. Recommended text books:

- 7.3.1- Clinical Veterinary Microbiology, P.J. Quinn, M.E. Carter, B. Markey and G.R. Carter, 6th Edition 2004



Course specification of postgraduate

7.3.2- Veterinary Microbiology, Dwight C. Hirsh and Yuan Ghung Zee, 1999

7.3.3- Medical Microbiology, R. Cruickshank 1986.

7.3.4- Mackie and McCartney Medical Microbiology, 14th Edition 1992 (J. P. Duguid, B.P. Marmion and R. H. A. Swain). (The book present in the faculty library)

7.3.5- Topley & Wilson microbiology and microbial infections, 9th Edition

7.3.6- Fish medicine, 1st Edition, (Michael K. Stoskopf, D. V. M.) Published by W.B. Saunders Company 1996, ISBN 0-7216-2629-7

7.3.6- Fish diseases diagnosis and treatment, 1st Edition, (Edward J. Noga) Published by Mosby. Year Book 1996, Editor: Lindal. Duncan, ISBN 1-55664-374-8

7.3.7- Diseases of carp, 1st Edition, Published by Fishing news books, 2002, ISBN 0-85238-252-9

7.4. Journals, Websitesetc

[Journal of Bacteriology](#)

[Microbiology](#)

[Microbiology and Immunology](#)

[Journal of Microbiology, Immunology and Infection](#)

[BMC Microbiology](#)

[Brazilian Journal of Microbiology](#)

[Microbiology and Molecular Biology Reviews](#)

[Internet Journal of Microbiology](#)

[Polish Journal of Microbiology](#)

[Journal of Microbiology and Biotechnology](#)

[African Journal of Microbiology Research](#)

[International Journal of Microbiology](#)

[Iranian Journal of Microbiology](#)

[Journal of aquatic animal health](#)

[Canadian Journal of fisheries & aquatic sciences](#)

[Journal of fish biology](#)

[Journal of fish diseases](#)

Websites

<http://www.sciencedirect.com>.

<http://www.Pubmed>.

<http://www.Altavista>.

<http://www.cellsalive.com>.

<http://www.textbookofbacteriology.net>.

http://www.ourfood.com/General_bacteriology.html

http://www.Veterinary_Microbiology

http://www.Immunology_and_Immunopathology

<WWW.aquariumfish.com>



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Course specification of postgraduate

WWW.nosickfish.com
WWW.kiovet.com
WWW.nationalfishpharm.com
WWW.fishdisease.net
WWW.aquatececo.com
WWW.aquatec-solutions.com
WWW.Aqualink.com/disease/s-

Course Coordinator

Dr. Hala Sayed Hassan

Ass. Prof. of Bacteriology, Mycology and Immunology, Faculty of Veterinary Medicine, Beni-Suef University

Head of the department

Prof. Dr. Ismail Abd El-Hafeez Radwan

Professor and Head of Bacteriology, Mycology and Immunology department, Faculty of Veterinary Medicine, Beni-Suef University



Course specification of postgraduate

Course specification Matrix

Week	Topic	Intended learning outcomes of course (ILOs)			
		K&U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
1-5	* General bacteriology	a1,a2	b1,b2,b7	c1	d1-d5& d7-d9
	* Molecular biology	a3,a4,a5	b1,b2,b3,a7	c7	d1-d5& d7-d9
	- Handling of fish samples - Microscopy, Bacterial morphology & Micrometry	a3,a4	b1,b2	c1,c2	d2,d4
6-8	* Introduction to invertebrates and invertebrates' Microbiology	a3,a4,a5	b1,b2,a7	c7	d1-d5& d7-d9
	- Serialization& disinfection	a6	b1,b2,b3	c2,c3,c4,c5,c6	
9-11	* Zoonotic disease transmitted by invertebrates.	a1,a2, a3,a4,a6,a7	b1,b2,b3,a7	c1	d1-d5& d7-d9
	- Staining of bacteria	a3,a4	b2	---	d2,d4
12-15	* Bacteria and fungi of Arthropods.	a1,a2, a3,a4,a5,a6	b1,b2,b3,a7	c1,c7	d1-d5& d7-d9
	- Isolation of bacteria	a3,a4	b1,b2,b3	c2,c3,c4,c5,c6	d2,d4
16-19	* Bacteria and fungi of Crustaceans.	a1,a2, a3,a4,a5,a6	b1,b2,b3,a7	c1,c7	d1-d5& d7-d9
	- Bacterial culture media	a3,a4	b1,b2,b3	c2,c3,c4,c5,c6	d2,d4
	- Purification of bacteria				
20-23	* Bacteria and fungi of Mollusca.	a1,a2, a3,a4,a5,a6	b1,b2,b3,a7	c1,c7	d1-d5& d7-d9
	- Biochemical identification of bacteria	a3,a4	b1,b2,b3	c2,c3,c4,c5,c6	d2,d4
24-27	* Bacteria and fungi of Helminthes.	a1,a2, a3,a4,a5,a6	b1,b2,b3,a7	c1,c7	d1-d5& d7-d9
	-Serological identification of bacteria	a3,a4,a5	b1,b2,b3	c2,c3,c4,c5,c6	d2,d4
28-29	* Control of bacterial disease of invertebrates	a6	b2,b6,b7	---	d2,d4
	- Molecular techniques	a3,a4,a5	b1,b2,b3	c2,c3,c4,c5,c6	d2,d4
30-32	*Principles of scientific research and the bases of designing an experimental work.	a7	b4,b5,b6	c8,c9	d6
	* Bases of writing a thesis and research plan - Chemotherapy	a6	b1,b2,b6	c2,c3,c4,c5,c6	d2,d4



Course specification of postgraduate

1-Basic information

Course Code:	Ph-87
Course title :	Diagnostic Bacteriology
Program title:	PhD
Contact hours/ week	4 hr/week (2hr theoretical and 2hr practical).
Approval Date	

2-Professional information

Overall aims of course:

This course aims to:

1. Work continuously to develop and increasing his/her in-depth knowledge in the field of veterinary bacteriology practice and having an appreciation of the current range of theoretical and research understanding in this area.
2. Master the various methods of data collection and application of analytical and critical approach in bacteriology field.
3. Create, design and explore a research in bacteriology and evaluate this research with appropriate.
4. Be aware of current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of bacteriology.
5. Develop the appropriate use of modern research techniques and applications used in mycology for mastering a wide range of bacteriology professional skills.
6. Designing, writing and presenting high quality dissertations and scientific papers in bacteriology field.
7. Elicit the molecular genetic of bacteria.
8. Use a range of advanced skills and laboratory techniques, including the purification of isolated bacterial pathogens and analyses of their proteins and nucleic acids for downstream applications.
9. Have skills for diagnosis of different bacterial pathogens as well as solve their problems and make decision based on available information.
10. Utilize efficiently the available resources and improving as well as offering new resources.
11. Consider continuous, self-learning and experience transfer.
12. Plan and designing an experimental work using bacterial isolate.

3- Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

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

- a.1. Acquire up to date concepts and in-depth knowledge in bacteria associated with veterinary public health significance.
- a.2. Perceive the current theories and advanced bacteriology scientific researches.
- a.3. Diagnose and identify different bacteria of veterinary and zoonotic importance.
- a.4. Apply the advanced research techniques used in the bacteriology field.



Course specification of postgraduate

- a.5. Apply recent molecular biology techniques in bacteriology research.
- a.6. Sustain quality control measures in bacteriology professional practices and acquire the knowledge and understanding required for protecting environment from bacterial infections and planning the infection management policy.
- a.7. Apply the bacteriology knowledge and combine it with relevant information in the field of his/her thesis.

b- Intellectual skills:

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

- b.1. Analyze, evaluate and interpret scientific bacteriology information autonomously using integrated approaches and accurately assess and criticize the applied researches for standardization and conclusion.
- b.2. Solve bacteriology problems based on the data available.
- b.3. Recognize the ethical constraints associated with the subject area and the ability to relate these to his/her experience.
- b.4. Diagnose and differentiate between different bacterial diseases.
- b.5. Conduct a research study and write a scientific article on bacterial problems in the field related to his/her thesis.
- b.6. Make decision based on available information in different professional contexts.
- b.7. Dialogue and discussion based on proofs and evidences.

c- Professional and practical skills

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

- c.1. Master the basic and modern professional practical skills relevant to bacteriology and achieve a high efficiency in laboratory skills.
- c.2. Manage and handle the different infected specimens safely and work in accordance with safety rules in a microbiology laboratory.
- c.3. Perform the different biochemical, serological, molecular and other techniques and apply different bacterial virulence tests used for lab diagnosis of bacterial infections.
- c.4. Write and assess professional reports in bacteriology.
- c.5. Evaluate and improve the available and required material, methods, tools and equipment in veterinary bacteriology research.
- c.6. Explain the basic genetic properties of bacteria and evaluate the effects of these properties to disease formation.
- c.7. Master an appropriate range of basic and modern professional skills, and the use of appropriate technological means to serve his/her thesis.
- c.8. Develop plans and experimental design for performing experiments related to his/her thesis.

d- General and transferable skills

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

- d.1. Communicate effectively by all means and improve skills in written and verbal communication of complex information
- d.2. Use informational technology to serve the development of professional practice.
- d.3. Be responsible for learning and have the ability to work with and motivate others and



Course specification of postgraduate

- evaluate their performance.
- d.4. Achieve confidence in his/her thinking abilities and apply self-assessment and continuous learning.
- d.5. Utilize different sources of information and knowledge in the field of his/her thesis.
- d.6. Write scientific article according to the basics of scientific research to serve his/her thesis.
- d.7. Present research finding in oral and written form using appropriate software (e.g., power point, word, excel and database).
- d.8. Work in a team and lead teams.
- d.9. Manage scientific meetings and discussions as well as manage time efficiently.

4-Topics and contents

Course	Week	Topic (theoretical)	Hours	Practical topic	Hours
Diagnostic Bacteriology (Lec. 2h./week, Pract 2h./week)	1	-Morphology& Classification of bacteria	2	- Handling of bacteriological samples.	2
	2-3	-Bacterial structure	4	-Examination of Bacterial Morphology	4
	4	-Bacterial growth& Reproduction.	2	- Sterilization	2
	5	-Bacterial nutrition & metabolism.	2	- Disinfection& Disinfectants	2
	6	-Bacterial Variation& Dissociation	2	- Antimicrobial sensitivity tests (Disc diffusion& MIC methods)	2
	7-8	-Relationships of the bacteria to the host & environment.	4	- Bacterial staining techniques	4
	9-10	-Bacterial products	4	- Bacterial isolation& purification on different media.	4
	11-12	-Bacterial infection & virulence -Koch's postulates& their exceptions.	4	- Biochemical tests for identification of bacteria.	4
	13-15	-Bacterial chromosome& plasmids. -Gene expression -Mutations and mutagenic agents.	2 2 2	- Serological & immunological tests for identification of bacteria.	6
	16-17	-Genetic engineering techniques and nucleic acid hybridization.	4	- Molecular techniques (PCR, real-time PCR, Gene sequencing)	4
	18	- Staphylococci	2	- <i>S. aureus</i> (Gram`s stain)	2
	19	-Streptococci	2	- Streptococci (Gram`s stain)	2
	20	- Listeria	2	- Streptococci in milk (Loeffler`s MB)	2
	21	- F. Bacillaceae: (G. Bacillus)	2	- Bacillus anthracoids (Gram`s stain)	2
	22-23	- G. Clostridium	4	- <i>Clostridium</i> species (Gram`s stain)	4
	24	- Corynebacteria	2	- Corynebacteria (Gram`s stain)	2
	25	- Mycobacterium	2	- Mycobacterium (Zeihl-Neelsen stain)	2
	26-27	- Enterobacteriaceae (<i>E. coli</i> , Salmonella, Klebsiella, Shigella,....)	4	- Enterobacteriaceae (Gram`s stain) - Enterobacteriaceae (Biochemical)	2 2
	28	- Pasteurella	2	- Pasteurella (Leishman`s stain)	2
	29	- Brucella - Campylobacter	2	- Campylobacter Morphology (Projector slides)	2
30	- <i>Pseudomonas</i> & <i>Burkholderia</i> species	2	<i>P. aeruginosa</i> (Gram`s stain)	2	
31	- Spirochaetes	2	-Spirochaetes (Projector slides)	2	
32	- Mycoplasma, Chlamydia& Rickettsia	2	- Mycoplasma, Chlamydia& Rickettsia (Projector slides)	2	
3-34	Principles of scientific research& the bases of designing an experimental work using bacterial isolates and writing a thesis.	4	- Revision	4	
Total			68		68



Course specification of postgraduate

5-Teaching and learning methods

5.1- Lectures (brain storming, discussion) using board and data shows.

5.2- Self learning Electronic learning, Presentations, Essays or Seminars by scientific search on related websites, international, national and local journals, related books in faculty library.

5.3- Practical sections.

- Microscopical and colonial examination of different bacteria.
- Biochemical tests for identification of different bacteria.
- Advanced immunological and serological tests for identification of bacteria.
- Molecular identification of bacteria.

6-Student assessment

6.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
Writing Exam	a1,a2,a3,a4,a5,a6	b1,b2,b3,b4,b5	c6,c7	d4,d5,d6
Practical Exam	a3,a4,a5,a6	b1,b2,b4,b6	c1,c2,c3,c4,c5,c8	d2, d4
Oral Exam	a1,a2,a3,a4,a5,a6,a7	b1,b2,b3,b4,b5,b7	c1,c6,c7	d4,d5,d6,d7,d9

6.2. Assessment schedules

Method	Week(s)
Practical exam	45-48
writing exam	45-48
Oral Exam	45-48

6.3. Weight of assessments

Assessment	Weight of assessment
Writing exam	50%
Practical exam	25%
Oral exam	25%
Total	100%

7- List of references

7.1. Notes and books

Departmental notes on:

7.1.1- Notes on Bacteriology, Mycology and Immunology.

7.1.2- Notes on Practical Bacteriology, Mycology and Immunology.

7.1.3- Notes on Veterinary Microbiology.

7.2. Essential books:

7.2.1- Bergey's Manual of Systematic Bacteriology, 4th Edition Noel R. Krieg, John G. Holt, and Murray R. G. E. 1984.

7.2.2- Prescott, Harley and Klein's Microbiology. J. M. Willey, L. M. Sherwood, and C. J. Woolverton – 17th Edition, International Edition , 2008, Mc Graw Hill



Course specification of postgraduate

7.2.3- Bergey's Manual of Determinative Bacteriology, 9th Edition John G. Holt, 1993

7.2.4- Diagnostic Microbiology, 2nd Edition 2000 Connie R. Mahon and George Manuselis.

7.3. Recommended text books:

7.3.1- Clinical Veterinary Microbiology, P.J. Quinn, M.E. Carter, B. Markey and G.R. Carter, 6th Edition 2004

7.3.2- Veterinary Microbiology, Dwight C. Hirsh and Yuan Ghung Zee, 1999

7.3.3- Medical Microbiology, R. Cruickshank 1986.

7.3.4- Mackie and McCartney Medical Microbiology, 14th Edition 1992 (J. P. Duguid, B.P. Marmion and R. H. A. Swain). (The book present in the faculty library)

7.3.5- Medical Mycology, 1992 K. J. Kwon-Chung and John E. Bennett.

7.3.6- Introductory Mycology, 3rd Edition 1979, C.J. Alexopoulos and C.W. Mims.

7.3.7- Immunology, 1986 D. M. Weir.

7.3.8- Medical Immunology, 1977, Malcolm S. Thaler, M. D. and Richard D.

7.3.9- Topley & Wilson microbiology and microbial infections, 9 th edition

7.4. Journals, Websitesetc

[Journal of Bacteriology](#)

[Microbiology](#)

[Microbiology and Immunology](#)

[Journal of Microbiology, Immunology and Infection](#)

[BMC Microbiology](#)

[Brazilian Journal of Microbiology](#)

[Microbiology and Molecular Biology Reviews](#)

[Internet Journal of Microbiology](#)

[Polish Journal of Microbiology](#)

[Journal of Microbiology and Biotechnology](#)

[African Journal of Microbiology Research](#)

[International Journal of Microbiology](#)

[Iranian Journal of Microbiology](#)

Websites

<http://www.sciencedirect.com>.

<http://www.Pubmed>.

<http://www.Altavista>.

<http://www.cellsalive.com>.

<http://www.textbookofbacteriology.net>.

http://www.ourfood.com/General_bacteriology.html

http://www.Veterinary_Microbiology

http://www.Immunology_and_Immunopathology



Beni-Suef University
Faculty of Veterinary Medicine



Course specification of postgraduate

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Course specification of postgraduate

Course specification Matrix

Week	Topic	Intended learning outcomes of course (ILOs)			
		K&U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
1	* Morphology& Classification of bacteria.	a1,a2,a3	b1,b2,b4,b7	c7	d1-d5& d7-d9
	- Handling of bacteriological samples.	a3,a4,a6	b2	c2,c5	d4
2-3	* Bacterial structure.	a1,a2,	b1,b7	c7	d1-d5& d7-d9
	- Examination of Bacterial Morphology.	a3,a4	b1,b2,b4,b6	c3,c4,c5	d2,d4
4	*Bacterial growth& Reproduction.	a1,a2,	b1,b7	c7	d1-d5& d7-d9
	- Sterilization.	a6	b1,b2	c4,c5	d2,d4
5	* Bacterial nutrition & metabolism.	a1,a2,	b1,b7	c7	d1-d5& d7-d9
	- Disinfection& Disinfectants.	a6	b1,b2	c4,c5	d2,d4
6	* Bacterial Variation& Dissociation.	a1,a2,	b1,b7	c7	d1-d5& d7-d9
	- Antimicrobial sensitivity tests (Disc diffusion& MIC methods).	a6	b1,b2	c4,c5	d2,d4
7-8	* Relationships of the bacteria to the host & environment.	a1,a2,	b1,b7	c7	d1-d5& d7-d9
	- Bacterial staining techniques.	a3,a4	b1,b2,b4,b6	c3,c4,c5	d2,d4
9-10	* Bacterial products.	a1,a2,a3	b1,b2,b4,b7	c7	d1-d5& d7-d9
	- Bacterial isolation& purification on different media.	a3,a4	b1,b2,b4,b6	c3,c4,c5	d2,d4
11-12	* Bacterial infection & virulence	a1,a2,a3,a6	b1,b2,b7	c7	d1-d5& d7-d9
	* Koch's postulates& their exceptions.				
	- Biochemical tests for identification of bacteria.	a3,a4	b1,b2,b4,b6	c3,c4,c5	d2,d4
13-15	13 * Bacterial chromosome& plasmids.	a1-a5	b1,b7	c6,c7	d1-d5& d7-d9
	14 * Gene expression				
	15 * Mutations and mutagenic agents.				
	- Serological & immunological tests for identification of bacteria.	a3,a4	b1,b2,b4,b6	c3,c4,c5	d2,d4
16-17	* Genetic engineering techniques & nucleic acid hybridization.	a1-a5	b1,b7	c6,c7	d1-d5& d7-d9
	- Molecular techniques (PCR, real-time PCR, Gene sequencing).	a3,a4,a5	b1,b2,b4,b6,b7	c1,c5,a6,c7	d2,d4
18	* Staphylococci.	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	- <i>S. aureus</i> (Gram`s stain).	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4
19	* Streptococci.	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	- Streptococci (Gram`s stain).	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4



Course specification of postgraduate

20	* <i>Listeria</i> .	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	- <i>Streptococci</i> in milk (Loeffler`s MB)	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4
21	* <i>F. Bacillaceae: (G. Bacillus)</i> .	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	- <i>Bacillus anthracoids (Gram`s stain)</i> .	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4
22-23	* <i>G. Clostridium</i> .	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	- <i>Clostridium</i> species (Gram`s stain).	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4
24	* <i>Corynebacteria</i> .	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	- <i>Corynebacteria (Gram`s stain)</i> .	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4
25	* <i>Mycobacterium</i> .	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	- <i>Mycobacterium (Zeihl-Neelsen stain)</i> .	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4
26-27	* <i>Enterobacteriaceae (E. coli, Salmonella, Klebsiella, Shigella,....)</i> .	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	- <i>Enterobacteriaceae (Gram`s stain)</i> .	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4
	- <i>Enterobacteriaceae (Biochemical)</i> .				
28	* <i>Pasteurella</i> .	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	- <i>Pasteurella (Leishman`s stain)</i> .	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4
29	* <i>Brucella</i> .	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	* <i>Campylobacter</i> .				
	- <i>Campylobacter Morphology (Projector slides)</i> .	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4
30	* <i>Pseudomonas & Burkholderia</i> species.	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	- <i>P. aeruginosa (Gram`s stain)</i> .	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4
31	* <i>Spirochaetes</i> .	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	- <i>Spirochaetes (Projector slides)</i> .	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4
32	* <i>Mycoplasma, Chlamydia & Rickettsia</i> .	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	- <i>Mycoplasma, Chlamydia & Rickettsia (Projector slides)</i>	a3,a4	b2,b4,b6	c3,c4,c5	d2,d4
33-34	* <i>Principles of scientific research & the bases of designing an experimental work using bacterial isolates and writing a thesis.</i>	a2,a6,a7	b3,b5,b7	c1,c2,c8	d6
	- Revision.				



Course specification of postgraduate

1-Basic information

Course Code:	PhD-88
Course title :	Immunology(Advanced course)
Program title:	PhD
Contact hours/ week	4 hr/week (2hr theoretical and 2hr practical).
Approval Date	

2-Professional information

Overall aims of course:

This course aims to:

1. Master the skills and management of scientific research in relation of diagnostic Immunology.
2. Use efficiently the most recent techniques and improve the skills of scientific research.
3. Create and manage a scientific environment.
4. Acquire knowledge, skills and practical experience about Physiology of immunity.
5. Provide the veterinarian master students with the knowledge and skills to equip them for a career in diagnostic veterinary immunology.
6. Develop the competence in applying clinical skills to the veterinary practice.
7. Developing the critical and analytical powers of the student in relation to basic and diagnostic Immunology.
8. Enumerate different types of vaccines used in protection against different microbial diseases.
9. Recognize the applications of Monoclonal Antibodies.
10. Control the problems concerning with different veterinary affections and prevent the spread of the infection in the community.
11. React with current veterinary and public health problems related to autoimmune diseases.
12. Write the dissertation, scientific papers and apply for scientific projects.
13. Perform academic and professional self-development and continuous learning.

3- Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

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

- a.1. Distinguish basis of diagnostic Immunology.
- a.2. Identify cell mediated and humoral immune response.
- a.3. Recognize cytokines and their role in immunology.
- a.4. Acquire knowledge from complex scientific papers.
- a.5. List the extensively updated immunologic laboratory tests and advanced methods aid in rapid clinical diagnosis.
- a.6. Recognize different types of vaccines used in protection against different microbial diseases.
- a.7. List types of hypersensitivity and the significance of delayed type.
- a.8. Recognize the applications of Monoclonal Antibodies.



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b- Intellectual skills:

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

- b.1. Analyze research and a variety of types of information and evidence critically.
- b.2. Interpret data of diagnostic immunology.
- b.3. Make accurate risk assessments when required for all procedures undertaken in the laboratory
- b.4. Suggest the solutions of the problems concerning with different veterinary microbial affections.
- b.5. Formulate new immunological explanation.

c- Professional and practical skills

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

- c.1. Perform out the immunological laboratory diagnostic techniques accurately and safely.
- c.2. Evaluate the effects of different vaccines.
- c.3. Apply delayed hypersensitivity in diagnosis.
- c.4. Master the basic professional skills and modern in the area of Immunology.
- c.5. Assess methods and tools in the area of Immunology.

d- General and transferable skills

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

- d.1. Work in a team work and manage time.
- d.2. Communicate effectively using different means.
- d.3. Properly use the information technologies for development of his/her professional abilities.
- d.4. Use different facilities for gaining knowledge and information.
- d.5. Understand the significance and means of continuous self-learning.

4-Topics and contents

Topic	No. of hours	Practical	No. of hours
<ul style="list-style-type: none"> • Structure of the immune system 	8	Preparation of blood samples for immunological diagnosis.	8
<ul style="list-style-type: none"> • innate immunity • Specific acquired immunity 	8	Preparation of serial dilution and buffers of different normality and molarity.	8
<ul style="list-style-type: none"> • Antigen and Immunogenicity. • Cytokines and other immune cell products. 	8	Enzyme linked immunosorbant assay	8
<ul style="list-style-type: none"> • The complement system. • Regulation of the immune response. 	8	Complement fixation test	8
<ul style="list-style-type: none"> • Histocompatibility antigens and other Histocompatibility complex. 	8	Agglutination test. Slide and tube agglutination, latex agglutination and co-agglutination.	8



Course specification of postgraduate

<ul style="list-style-type: none"> Immunoglobulins Cells cooperation for humeral and cell mediated immunity 	8	Lymphocyte transformation test and macrophage migration inhibition assay.	10
<ul style="list-style-type: none"> Hypersensitivity. Immunostimulants and immunosuppressors 	8	Skin test and recent techniques.	8
<ul style="list-style-type: none"> Vaccine, vaccination and adjuvant. 	8	Phagocytic activities and macrophage killing assay.	6
<ul style="list-style-type: none"> monoclonal antibodies 	8	Separation & counting of lymphocytes and macrophages.	2
Total	72		72

5-Teaching and learning methods

5.1- Lectures (brain storming, discussion) using board and data shows.

5.2- Self learning Electronic learning, Presentations, Essays or Seminars by scientific search on related websites, international, national and local journals, related books in faculty library.

5.3- Practical sections.

- Immunological and serological tests for identification of bacteria.

6-Student assessment

6.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
written exam	a1 to a8 (all)	b1 to b5 (all)	-	d1
Practical Exam	a1, a2, a5		c1 to c5 (all)	
Oral Exam	a1 to a8 (all)		c1 to c5 (all)	

6.2. Assessment schedules

Method	Week(s)
Practical exam	45-48
written exam	45-48
Oral Exam	45-48

6.3. Weight of assessments

Assessment	Weight of assessment
written exam	50%
Practical exam	25%
Oral exam	25%
Total	100%

7- List of references

7.1. Notes and books

Departmental notes on:



Course specification of postgraduate

7.1.1- Notes on Bacteriology, Mycology and Immunology.

7.1.2- Notes on Practical Bacteriology, Mycology and Immunology.

7.2. Essential books:

7.2.1. Prescott, Harley and Klein's Microbiology. J. M. Willey, L. M. Sherwood, and C. J. Woolverton – 17th Edition, International Edition , 2008, Mc Graw Hill.

7.2.2. Experimental immunology 3rd ed. by Burrell and Mascoll (2010)

7.2.3. Veterinary Immunology: An Introduction by Ian R. Tizard (2008)

7.2.4. Immunology, 1986 D. M. Weir.

7.2.5. Medical Immunology, 1977, Malcolm S. Thaler, M. D. and Richard D.

7.3. Recommended text books:

7.3.1. Veterinary Microbiology, Dwight C. Hirsh and Yuan Ghung Zee, 1999

7.3.2. Immunology, 1986 D. M. Weir.

7.3.3. Medical Immunology, 1977, Malcolm S. Thaler, M. D. and Richard D.

7.4. Journals, Websitesetc

Microbiology

Microbiology and Immunology

Journal of Microbiology, Immunology and Infection

BMC Microbiology

Brazilian Journal of Microbiology

Microbiology and Molecular Biology Reviews

Internet Journal of Microbiology

Polish Journal of Microbiology

Journal of Microbiology and Biotechnology

African Journal of Microbiology Research

International Journal of Microbiology

Iranian Journal of Microbiology

Websites

<http://www.sciencedirect.com>.

<http://www.Pubmed>.

<http://www.AltaVista>.

<http://www.cellsalive.com>.

<http://www.textbookofbacteriology.net>.

<http://www.Immunology and Immunopathology>

Course Coordinator

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Course specification of postgraduate Course specification Matrix

Topic	No. of hours	Intended learning outcomes of course (ILOs)			
		K&U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
<ul style="list-style-type: none"> Structure of the immune system Preparation of blood samples for immunological diagnosis. 	1-4	a1	b1-b5 (all)	c1,c4,c5	d1-d5 (all)
<ul style="list-style-type: none"> innate immunity Specific acquired immunity Preparation of serial dilution and buffers of different normality and molarity. 	5-8	a1	b1-b5 (all)	c1,c4,c5	d1-d5 (all)
<ul style="list-style-type: none"> Antigen and Immunogenicity. Cytokines and other immune cell products. Enzyme linked immunosorbant assay 	9-12	a1,a3,a5	b1-b5 (all)	c1,c4,c5	d1-d5 (all)
<ul style="list-style-type: none"> The complement system. Regulation of the immune response. Complement fixation test 	13-16	a1,a4,a5	b1-b5 (all)	c1,c4,c5	d1-d5 (all)
<ul style="list-style-type: none"> Histocompatibility antigens and other Histocompatibility complex. Agglutination test. Slide and tube agglutination, latex agglutination and co-agglutination. 	17-20	a1,a4,a5	b1-b5 (all)	c1,c4,c5	d1-d5 (all)
<ul style="list-style-type: none"> Immunoglobulins Cells cooperation for humeral and cell mediated immunity Lymphocyte transformation test and macrophage migration inhibition assay. 	21-24	a1,,a2,a4, a5	b1-b5 (all)	c1,c4,c5	d1-d5 (all)
<ul style="list-style-type: none"> Hypersensitivity. Immunostimulation and immunosuppression Skin test and recent techniques. 	25-28	a4,a5,a7	b1-b5 (all)	c1,c3,c4,c5	d1-d5 (all)
<ul style="list-style-type: none"> Vaccine, vaccination and adjuvant. Phagocytic activities and macrophage killing assay. 	29-32	a2, a6	b1-b5 (all)	c1,c2,c4,c5	d1-d5 (all)
<ul style="list-style-type: none"> monoclonal antibodies Separation & counting of lymphocytes and macrophages. 	33-36	a2	b1-b5 (all)	c1,c4,c5	d1-d5 (all)



Beni Suef University
Faculty of Veterinary Medicine



Course specification of postgraduate



Course specification of postgraduate

1-Basic information

Course Code:	Ph-89
Course title :	Mycology (Advanced course)
Program title:	PhD
Contact hours/ week	3 hr/week (1hr theoretical and 2hr practical).
Approval Date	

2-Professional information

Overall aims of course:

This course aims to:

1. Work continuously to develop and increasing his/her in-depth knowledge in the field of veterinary mycology practice and having an appreciation of the current range of theoretical and research understanding in this area.
2. Master the various methods of data collection and application of analytical and critical approach in mycology field.
3. Create, design and explore a research in mycology and evaluate this research with appropriate.
4. Be aware of current veterinary and public health problems and recent related approaches much of which are at, or informed by, the forefront of mycology.
5. Develop the appropriate use of modern research techniques and applications used in mycology for mastering a wide range of mycology professional skills.
6. Designing, writing and presenting high quality dissertations and scientific papers in mycology field.
7. Elicit the molecular genetic of fungi.
8. Use a range of advanced skills and laboratory techniques, including the purification of isolated fungal pathogens and analyses of their proteins and nucleic acids for downstream applications.
9. Have skills for diagnosis of different fungal pathogens as well as solve their problems and make decision based on available information.
10. Utilize efficiently the available resources and improving as well as offering new resources.
11. Consider continuous, self-learning and experience transfer.
12. Plan and designing an experimental work using fungal isolate.

3- Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

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

- a.1. Acquire up to date concepts and in-depth knowledge in fungi associated with veterinary public health significance.
- a.2. Perceive the current theories and advanced mycology scientific researches.
- a.3. Diagnose and identify different fungi of veterinary and zoonotic importance.



Course specification of postgraduate

- a.4. Apply the advanced research techniques used in the mycology field.
- a.5. Apply recent molecular biology techniques in mycology research.
- a.6. Sustain quality control measures in mycology professional practices and acquire the knowledge and understanding required for protecting environment from fungal infections and planning the infection management policy.
- a.7. Apply the mycology knowledge and combine it with relevant information in the field of his/her thesis.

b- Intellectual skills:

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

- b.1. Analyze, evaluate and interpret scientific mycology information autonomously using integrated approaches and accurately assess and criticize the applied researches for standardization and conclusion.
- b.2. Solve mycology problems based on the data available.
- b.3. Recognize the ethical constraints associated with the subject area and the ability to relate these to his/her experience.
- b.4. Diagnose and differentiate between different fungal diseases.
- b.5. Conduct a research study and write a scientific article on mycotic problems in the field related to his/her thesis.
- b.6. Make decision based on available information in different professional contexts.
- b.7. Dialogue and discussion based on proofs and evidences.

c- Professional and practical skills

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

- c.1. Master the basic and modern professional practical skills relevant to mycology and achieve a high efficiency in laboratory skills.
- c.2. Manage and handle the different infected specimens safely and work in accordance with safety rules in a microbiology laboratory.
- c.3. Perform the different biochemical, serological, molecular and other techniques and apply different fungal virulence tests used for lab diagnosis of fungal infections.
- c.4. Write and assess professional reports in mycology.
- c.5. Evaluate and improve the available and required material, methods, tools and equipment in veterinary mycology research.
- c.6. Explain the basic genetic properties of fungi and evaluate the effects of these properties to disease formation.
- c.7. Master an appropriate range of basic and modern professional skills, and the use of appropriate technological means to serve his/her thesis.
- c.8. Develop plans and experimental design for performing experiments related to his/her thesis.

d- General and transferable skills

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

- d.1. Communicate effectively by all means and improve skills in written and verbal



Course specification of postgraduate

- communication of complex information
- d.2. Use informational technology to serve the development of professional practice.
 - d.3. Be responsible for learning and have the ability to work with and motivate others and evaluate their performance.
 - d.4. Achieve confidence in his/her thinking abilities and apply self-assessment and continuous learning.
 - d.5. Utilize different sources of information and knowledge in the field of his/her thesis.
 - d.6. Write scientific article according to the basics of scientific research to serve his/her thesis.
 - d.7. Present research finding in oral and written form using appropriate software (e.g., power point, word, excel and database).
 - d.8. Work in a team and lead teams.
 - d.9. Manage scientific meetings and discussions as well as manage time efficiently.

4-Topics and contents

Course	Week	Topic (theoretical)	Hours	Practical topic	Hours
Mycology (Advanced course) (Lec. 1h./week, Pract 2h./week)	1-2	- Structure of fungal cell and fungal colony.	2	Handling of mycotic samples (Collection & transportation)	4
	3-4	- Fungal reproduction. - Fungal growth.	2	Identification of fungal cultures	4
	5-6	-Classification of fungi.	2	Microscopical identification of Yeasts (Different stains)	4
	7-11	- Identification of fungi. - Fungal products - Fungal infection and virulence	3 1 1	- Isolation and identification of Yeasts - Biochemical identification of Yeasts	4 6
	12-18	- Fungal genetics - Yeasts (<i>Candida</i> - <i>Cryptococcus</i>) - Moulds (<i>Aspergillus</i> , <i>Penicillium</i> and other species)	2 2 3	-Microscopical identification of Moulds - Isolation and identification of Moulds	6 8
	19-21	-Dermatomycosis and Dermatophytosis -Subcutaneous mycosis	3	-Molecular identification of fungi	6
	22-24	-Diphasic fungi (<i>Histoplasma</i> spps, <i>Coccidioides</i> , <i>Blastomyces</i> , <i>Sporothrix</i>)	3	- Diphasic fungi	6
	25-27	- Zygomycetes - Demataceous fungi	3	- Zygomycetes - Demataceous fungi	6
	28-29	- Mycotoxins	2	Mycotoxins	4
	30-32	Principles of scientific research and the bases of designing an experimental work using fungal isolates and writing a thesis.	3	Antimycotics & Antifungal susceptibility	6
	Total		32		64

5-Teaching and learning methods

- 5.1- Lectures (brain storming, discussion) using board and data shows.
- 5.2- Self learning Electronic learning, Presentations, Essays or Seminars by scientific search



Course specification of postgraduate

on related websites, international, national and local journals, related books in faculty library.

5.3- Practical sections.

- Microscopical and colonial examination of different fungi.
- Biochemical tests for identification of different fungi.
- Molecular identification of fungi.

6-Student assessment

6.1. Assessments methods:

Method	Matrix alignment of the measured ILOs/ Assessments methods			
	K&U	I.S	P&P.S	G.S
Writing Exam	a1,a2,a3,a4,a5,a6	b1,b2,b3,b4,b5	c6,c7	d4,d5,d6
Practical Exam	a3,a4,a5,a6	b1,b2,b4,b6	c1,c2,c3,c4,c5,c8	d2, d4
Oral Exam	a1,a2,a3,a4,a5,a6,a7	b1,b2,b3,b4,b5,b7	c1,c6,c7	d4,d5,d6,d7,d9

6.2. Assessment schedules

Method	Week(s)
Practical exam	45-48
writing exam	45-48
Oral Exam	45-48

6.3. Weight of assessments

Assessment	Weight of assessment
Writing exam	50%
Practical exam	25%
Oral exam	25%
Total	100%

7- List of references

7.1. Notes and books

Departmental notes on:

- 7.1.1- Notes on Bacteriology, Mycology and Immunology.
- 7.1.2- Notes on Practical Bacteriology, Mycology and Immunology.

7.2. Essential books:

- 7.2.1- Medical Mycology by Kevim Kavanagh (2007)
- 7.2.2 - Modern Mycology by J.W.Deacon (1997)
- 7.2.3- Prescott, Harley and Klein's Microbiology. J. M. Willey, L. M. Sherwood, and C. J. Woolverton – 17th Edition, International Edition, 2008, Mc Graw Hill
- 7.2.4- Diagnostic Microbiology, 2nd Edition 2000 Connie R. Mahon and George Manuselis.

7.3. Recommended text books:

- 7.3.1- Clinical Veterinary Microbiology, P.J. Quinn, M.E. Carter, B. Markey and G.R. Carter,



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6th Editio2004

7.3.2- Veterinary Microbiology, Dwight C. Hirsh and Yuan Ghung Zee, 1999

7.3.3- Medical Microbiology, R. Cruickshank 1986.

7.3.4- Mackie and McCartney Medical Microbiology, 14th Edition 1992 (J. P. Duguid, B.P. Marmion and R. H. A. Swain). (The book present in the faculty library)

7.3.5- Medical Mycology, 1992 K. J. Kwon-Chung and John E. Bennett.

7.3.6- Introductory Mycology, 3rd Edition 1979, C.J. Alexopoulos and C.W. Mims.

7.3.9- Topley & Wilson microbiology and microbial infections, 9 th edition

7.4. Journals, Websitesetc

[Journal of Medical and Veterinary Mycology](#)

[Medical mycology](#)

[Acta Mycologia](#)

[Microbiology](#)

[Microbiology and Immunology](#)

[Journal of Microbiology, Immunology and Infection](#)

[BMC Microbiology](#)

[Brazilian Journal of Microbiology](#)

[Microbiology and Molecular Biology Reviews](#)

[Internet Journal of Microbiology](#)

[Polish Journal of Microbiology](#)

[Journal of Microbiology and Biotechnology](#)

[African Journal of Microbiology Research](#)

[International Journal of Microbiology](#)

[Iranian Journal of Microbiology](#)

Websites

<http://www.sciencedirect.com>.

<http://www.Pubmed>.

<http://www.Altavista>.

<http://www.cellsalive.com>.

<http://www.textbookofbacteriology.net>.

<http://www.Veterinary Microbiology>

Course Coordinator

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Course specification of postgraduate

Course specification Matrix

Week	Topic	Intended learning outcomes of course (ILOs)			
		K&U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
1-2	*Structure of fungal cell and fungal colony.	a1,a2,	b1,b7	c7	d1-d5& d7-d9
	- Handling of mycotic samples (Collection & transportation)	a3,a4,a6	b2	c2,c5	d4
3-4	* Fungal reproduction.	a1,a2	b1,b7	c7	d1-d5& d7-d9
	* Fungal growth.				
	- Identification of fungal cultures	a3,a4	b1,b2,b4	c3,c5	d2,d4
5-6	*Classification of fungi.	a1,a2,	b1,b7	c7	d1-d5& d7-d9
	- Microscopical identification of Yeasts (Different stains)	a3,a4	b1,b2,b4,b6	c3,c4,c5	d2,d4
7-11	* Identification of fungi.	a1,a2,a3	b1,b2,b4,b7	c7	d1-d5& d7-d9
	* Fungal products				
	* Fungal infection and virulence	a1,a2,a3,a6	b1,b2,b7		
	- Isolation and identification of Yeasts	a3,a4	b1,b2,b4,b6	c3,c4,c5	d2,d4
	- Biochemical identification of Yeasts				
12-18	* Fungal genetics	a1-a5	b1,b7	c6,c7	d1-d5& d7-d9
	* Yeasts	a1-a6	b1,b2,b4,b6,b7	c7	
	* Moulds				
	-Microscopical identification of Moulds	a3,a4	b1,b2,b4,b6	c3,c4,c5	d2,d4
	- Isolation and identification of Moulds				
19-21	*Dermatomycosis and Dermatophytosis	a1-a6	b1,b2,b4,b6,b7	c7	d1-d5& d7-d9
	*Subcutaneous mycosis				
	-Molecular identification of fungi	a3,a4,a5	b1,b2,b4,b6,b7	c1,c5,a6,c7	d2,d4
22-24	*-Diphasic fungi	a1-a6	b1,b2,b4,b6,b7	c1,c7	d1-d5& d7-d9
25-27	*- Zygomycetes	a1-a4	b1,b2,b4,b6,b7	c1,c7	d1-d5& d7-d9
	*- Demataceous fungi				
28-29	*- Mycotoxins	a1-a6	b1,b2	c1,c7	d1-d5& d7-d9
30-32	*Principles of scientific research and the bases of designing an experimental work using fungal isolates and writing a thesis.	a2,a6,a7	b3,b5,b7	c1,c2,c8	d6
	- Antimycotics & Antifungal susceptibility	a6	b1,b2	c4	-