



Course Specification of Veterinar Bacteria and Fungi

I. Course Identification and General Information:						
1	Course Title:	Veterinary Bacteria and Fungi				
2	Course Number & Code:	MI353				
3	Credit hours:	C.H				Total
		Theoretical	Practical	Training	Seminar	
		2	1	0	0	3
4	Study level/ semester at which this course is offered:	Third year: second semester				
5	Pre –requisite (if any):	MI352				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor's degree (B. Sc.) Veterinary Medicine				
8	Language of teaching the course:	English				
9	Location of teaching the course:	Faculty of veterinary medicine				
10	Prepared by:	Dr. hamid.A.N. Alrefaiey				
11	Date of approval:					

II. Course description:

Prepared by
Dr. Hamid Alrefaiey

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Dr. Abdurraqeb Alshami

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The course will introduce the student to the microbial world and the relationship of that world with the environment, animal, bird, and human health. Students should develop an appreciation for the ubiquity, longevity and importance of bacterial and fungal species. Students should elicit solutions for different veterinary bacterial and fungal problems. The structure of the course is based on presenting the fundamental characteristics bacterial and fungal species (growth, metabolism, reproduction, nutrition, cultivation, and identification); pathogenicity of different veterinary bacteria and fungi And their virulence factors and antimicrobial resistance; different methods for Diagnosing different veterinary bacterial and fungal infections.

III. Intended learning outcomes (ILOs) of the course:

(A) Knowledge and Understanding:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **Knowledge and Understanding.**

Program Intended Learning Outcomes (Sub-PILOs) in: Knowledge and Understanding		Course Intended Learning Outcomes (CILOs) in: Knowledge and Understanding	
After completing this program, students will be able to:		After completing this course, students will be able to:	
A1-	Demonstrate a sound knowledge and understanding of concepts and principles of general culture, basic science, and that support veterinary medicine.	a1-	Describe the nature, classification, morphology and structure of bacterial and fungal cells.
A2-	Clarifies basic concepts, principles, and theories related to animal production, animal health and nutrition, behavior management, breeding and care that is related to animal ethical codes.	a2-	Recognize growth requirements, physiology, reproduction and products of bacteria and fungi.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Knowledge and Understanding to Teaching and Assessment Methods:

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Course Intended Learning Outcomes (CILOs) in Knowledge and Understanding		Teaching strategies/methods to be used	Methods of assessment
completing this course, students will be able to:		<ul style="list-style-type: none"> ▪ Lecture by data show ▪ Dialogue and discuss ▪ Practical practice ▪ self directed learning skills. ▪ Analyze the results and reach specific conclusion. ▪ Writing a review paper to gain the skills of self-learning and presentation ▪ Sample collection, preservation, examination and identification. 	<ul style="list-style-type: none"> ▪ Written examination ▪ Quiz ▪ Oral examination ▪ Practical examination ▪ Activities ▪ Reports evaluation
a1-	Describe the nature, classification, morphology and structure of bacterial and fungal cells.		
a2-	Recognize growth requirements, physiology, reproduction and products of bacteria and fungi.		

(B) Intellectual Skills:			
Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Intellectual skills			
Program Intended Learning Outcomes (Sub-PILOs) in Intellectual skills		Course Intended Learning Outcomes (CILOs) of Intellectual Skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
B2-	Predicts an appropriate medical diagnosis for the most common disease states through analysis of clinical story data and the results of medical examinations of a sick animal.	b1-	Differentiate between different bacterial and fungal pathogens.
B3-	Design appropriate nursing and treatment care plans for different diseases that affect animals, prioritizing treatment.	b2-	Select the suitable sample and the suitable laboratory test for diagnosis.
Teaching And Assessment Methods For Achieving Learning Outcomes:			
Alignment of Learning Outcomes of Intellectual Skills to Teaching Methods and Assessment Methods:			
Course Intended Learning Outcomes (CILOs) in Intellectual Skills.		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		▪ Dialogue and discuss	▪ Written examination

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b1-	Differentiate between different bacterial and fungal pathogens.	<ul style="list-style-type: none"> ▪ Lecture ▪ Practical practice 	<ul style="list-style-type: none"> ▪ Oral examination ▪ Practical examination
b2-	Select the suitable sample and the suitable laboratory test for diagnosis.	<ul style="list-style-type: none"> ▪ Problem solving ▪ Working in groups ▪ Labor training ▪ Researches and projects 	<ul style="list-style-type: none"> ▪ Performance notice ▪ Achievement file ▪ Reports evaluation ▪ Proposal evaluation

(C) Professional and Practical Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **Professional and Practical Skills**

Program Intended Learning Outcomes (Sub-PILOs) in Professional and Practical Skills		Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
C1-	Accurately records a comprehensive pathological story of a sick animal including information on healthy behavior and the necessary checks.	c1-	Collect, preserve and transport samples from animals, poultry and fish for microbiological examination.
C2-	Practices practical, diagnostic, clinical and research skills, including the collection of samples in various fields of veterinary medicine and related sciences, in a safe and effective manner, considering the ethics of the profession.	c2-	Prepare different types of culture media, obtain pure culture and describe colonies' morphology.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Professional and Practical Skills to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		-Practical practice	- Written examinations
c1-	Collect, preserve and transport samples from		

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	animals, poultry and fish for microbiological examination.	-Problem solving -Working in groups	- Oral examinations - Practical examination
c2-	Prepare different types of culture media, obtain pure culture and describe colonies' morphology.	-Collaborative learning	- Performance notice - Achievement file - Reports evaluation - Proposal evaluation

(D) General / Transferable Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **General and Transferable skills**

Program Intended Learning Outcomes (PILOs) in General / Transferable skills		Course Intended Learning Outcomes (CILOs) in General / Transferable skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
D3-	Practices problem-solving, negotiation, supervision and veterinary medical management skills and writing research reports efficiently and professionally.	d1-	Working in team (i.e., sharing presentations and discussions and solving problem).
D4	Works in normal conditions, crises and epidemics, alone and effectively within a medical team.	d2-	Reporting of the facts using printable sheets in the field of animal bacteriology and mycology.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of General and Transferable skills to Teaching and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in General and Transferable Skills		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		<ul style="list-style-type: none"> ▪ Dialogue and discuss ▪ Working in groups 	<ul style="list-style-type: none"> ▪ Achievement file ▪ Reports evaluation
d1-	Working in team (i.e., sharing presentations and discussions and solving problem).		

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d2-	Reporting of the facts using printable sheets in the field of animal bacteriology and mycology.	<ul style="list-style-type: none"> ▪ Scientific visits ▪ Researches and projects ▪ Self learning ▪ Problem solving 	<ul style="list-style-type: none"> ▪ Proposal evaluation ▪ Performance notice ▪ Practical examinations
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IV. Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	- introduction and classification of bacteria	a1,a2,b1,b2, c1,c2,d2	Gram positive and gram negative bacteria	1	2
2	Gram positive cocci; -Staphylococci	a1,a2,b1,b2, c1,c2,d2	Staphylococcus aureus, Staphylococcus spp: morphology and biochemical ,cultural characters.	1	4
3	Gram positive cocci; - Streptococci	a1,a2,b1,b2, c1,c2,d2	Streptococcus pyogenes, S. agalactia, S. disgalactia, S.equi, enterococci: morphology and biochemical ,cultural characters.	1	2
4	Gram Positive; Genus Bacillus, G. Listeria	a1,a2,b1,b2, c1,c2,d2	Bacillus anthracis, B.cereus, listeria species : morphology and biochemical ,cultural characters.	1	2
5	Gram Positive bacillus; Genus clostridium	a1,a2,b1,b2, c1,c2,d2	Clostridia species: morphology and biochemical ,cultural characters.	1	2
6	Gram Positive cocci and rods ; Corynebacteria, Nocardia, Actinomyces Mycobacterium	a1,a2,b1,b2, c1,c2,d2	Corynebacteria species, Nocardia, Actinomyces, Mycobacterium species; morphology and biochemical ,cultural characters.	2	4
7	Gram Negative bacteria: -Enterobacteriaceae	a1,a2,b1,b2, c1,c2,d2	E.coli, Salmonella, Yersinia, Shigella, Klebsiella, Enterobacter, Citrobacter,	1	2

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			Proteus, Edwardsiella: morphology and biochemical ,cultural characters.		
8	Gram Negative bacteria; - Pasteurella species, Mannheimia, genus Pseudomonas Actinobacillus	a1,a2,b1,b2, c1,c2,d2	Pasteurella multocida , Mannheimia, Actinobacillus,Pseudomonas Aeromonas: morphology and biochemical ,cultural characters.	1	2
9	Gram Negative bacteria; Brucella, Francisella, Burkholderia, Taylorella	a1,a2,b1,b2, c1,c2,d2	Brucella species, Francisella, Burkholderia, Taylorella: morphology and biochemical ,cultural characters.	1	2
10	Spiral bacteria	a1,a2,b1,b2, c1,c2,d2	Helicobacter, Campylobacter species, Arcobacter, Lawsonia; and Anaerobes, Leptospira, Borreliae and Treponema	1	2
11	-Mycoplasma, Chlamydia& Rickettsia	a1,a2,b1,b2, c1,c2,d2	Mycoplasma species, Chlamydia species & Rickettsia species	1	2
12	Fungal diseases ;Yeasts, Fungal diseases; aspergillus, Mycotoxins.	a1,a2,b1,b2, c1,c2,d2	Yeasts (Candida species, Cryptococcus species, Aspergillus species, types Mycotoxins.	1	2
13	fungal diseases of various body systems	a1,a2,b1,b2, c1,c2,d2	Trichophyton spices, microsporium species, epidermophyton species	1	2
Number of Weeks /and Units Per Semester				14	28

b- Training Aspect (Practical- tutorial):

Order	Training Tasks	CILOs (symbols)	Number of weeks	Contact hours
1	Genus staphylococcus; Staphylococcus aureus on culture (Gram`s stain), biochemical characters of S.aureus, virulence of S.aureus,	a1,a2,b1,b2,c1,c2,d2	1	2
2	Genus Streptococcus; Streptococcus species on culture (Gram`s stain), biochemical characters of streptococcus agalactia, virulence of S.agalactia, S. agalactiae in milk (Loeffler`s	a1,a2,b1,b2,c1,c2,d2	1	2

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	MB stain)			
3	Genus Bacillus; Bacillus anthracis on culture (Gram`s stain), biochemical characters of B. anthracis , virulence of B. anthracis	a1,a2,b1,b2,c1,c2,d2	1	2
4	Genus clostridium; clostridium species , C. welchii(perfringens) on culture (Gram`s stain), biochemical characters and virulence of C. welchii	a1,a2,b1,b2,c1,c2,d2	2	4
5	Corynebacteria on culture (Gram`s stain), biochemical characters and virulence of Corynebacterium.	a1,a2,b1,b2,c1,c2,d2	1	2
6	Enterobacteriaceae on culture (Gram`s stain), biochemical characters and virulence of salmonella and E. coli	a1,a2,b1,b2,c1,c2,d2	2	4
7	Genus Brucella ; Brucella species biochemical characters Brucella species on culture.	a1,a2,b1,b2,c1,c2,d2	1	2
8	Pseudomonas aeruginosa on culture (Gram`s stain), biochemical characters and virulence of P. aeruginosa.	a1,a2,b1,b2,c1,c2,d2	1	2
9	Genus mycobacterium; Mycobacterium species in sputum (Ziehl-Neelsen stain)	a1,a2,b1,b2,c1,c2,d2	1	2
10	P. multocida in blood/tissue film (Leishman's stain)	a1,a2,b1,b2,c1,c2,d2	1	2
11	Yeasts on culture (Gram`s stain).	a1,a2,b1,b2,c1,c2,d2	1	2
12	Diagnosis of fungal diseases; Dermatophytes, aspergillosis.	a1,a2,b1,b2,c1,c2,d2	1	2
Number of Weeks /and Units Per Semester			14	28

V. Teaching strategies of the course:

- Lectures depending on the sharing efforts of the students and supported with macromedia and multimedia aids.
- Training in the laboratory
- Self-learning (Electronic learning, Seminars, scientific search on related websites, international, national and local journals, related books in faculty library).

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- Summer training course.
- Assays and reviews.
- Discussion groups.
- Group work
- Problem Solving
- Assignments
- Brainstorming
- Log book
- Field visits

3-Assessment Methods:

- Written examination: For assessment of knowledge, back calling and Intellectual skills.
- Practical examination: For assessment of practical and professional skill.
- Oral examination: For assessment of knowledge and Intellectual skills.

Student activities: For assessment of knowledge and general and transferable skills.

VI. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)
1	Participation, quizzes and assignments	2-14	10	10%	a1,a2,b1,b2,c1,c2,d2
2	Mid-Term Exam	8	10	10%	a1,a2,b1,b2,c1,c2,d2
3	Mid-Term Practical Exam	8	10	10%	a1,a2,b1,b2,c1,c2,d2
4	Final Practical Exam	13	10	10%	a1,a2,b1,b2,c1,c2,d2
5	Oral Exam	13	5	5%	a1,a2,b1,b2,c1,c2,d2
6	Final Exam	16	55	55%	a1,a2,b1,b2,c1,c2,d2
Total			100	100%	

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VII. Students' Support:	
Office Hours/week	Other Procedures (if any)
From Saturday to Wednesday at 8:00 a.m. till 2 p.m.	Student can contact with me via e-mail

VIII. Learning Resource (MLA style or APA style)s:	
1- Required Textbook(s) (maximum two)	
	<ul style="list-style-type: none"> • Veterinary Microbiology and Microbial Diseases, 2002, Quinn etal. • - Essentials of Veterinary Microbiology, 5th ed.,1995 , Carter etal.
2- Recommended Readings and Reference Materials	
	<ol style="list-style-type: none"> 1- Veterinary Microbiology. Dwight C. Hirsh Yuan Chung Zee Publish, 1999 by Blackwell Sci Inc. 2- - Diagnostic Microbiology. Betty A. Forbes Daniel F. Sahn Alice S. Weissfeld 1998 by Most Inc – 3- Pathogenic Fungi in Humans and Animals. Edited by Pexter H. Howard Arcel dekker Inc Newyork.basl 2003. 4- - Fundamentals of Diagnostic Mycology. Fran fisher, M.Ed., M.t.(ASCP) W.B. SAUNDERS Company 1998. 5- - Bacterial Disease Mechanisms. Wilson M, McNab R and Henderson B (2002). Cambridge: Cambridge University Press.
3- Essential References	
	<p>-Oanne Willey, Stanley Fischer, and Richard Startz. 2010. Prescott's Microbiology 8th edition. McGraw-Hill Higher Education.</p> <p>-Baxter, A. P and E. Van der Linde (Eds.). 1999. Collecting and preserving fungi: A manual for mycology. ARC – Plant Protection Research Institute, South Africa. Ultra Litho (Pty) Ltd, Heriotda Johannesburg.</p> <p>Notes on Practical Bacteriology, Mycology.</p> <p>-Notes on Veterinary Microbiology.</p>

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	-Diagnosc Microbiology, 2nd Edion 2000 Connie R. Mahon and George Manuselis.
4- Electronic Materials and Web Sites etc.	
	<ul style="list-style-type: none"> - Journals, Websitesetc Journals 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 - 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 Intrnational of veterinary information services (IVIS) - www.Vet.net.com - http://microbiologyonline.org/ - http://www.microbiologybook.org/
5- Other Learning Material:	
	<ul style="list-style-type: none"> - Department notes: available for students to purchase from the department. - White board, overhead projector and data show presentations used during teaching. - Laboratory , apparatus, Chemicals, glasses reagents and media, Kits
X. Course Policies:	
1	Class Attendance: MANDATORY TO ATTEND ALL COURSE LECTURES
2	Tardy: Not allowed at all. Students must be in class 10 minutes prior to the beginning of lectures.
3	Exam Attendance/Punctuality: Attendance is mandatory; absence is accepted with valid excuse.
4	Assignments & Projects: All assignments and projects are to be submitted on their due date. Any assignment turned in after the due date will not be accepted without valid and reasonable excuse.

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5	Cheating: Not tolerated and may lead to EXPELLING the student from the program
6	Plagiarism: Not tolerated AT ALL and may lead to EXPELLING the student from the program
7	Other policies: <ol style="list-style-type: none">1. All devices must be on silent or at least on vibration during lectures/labs.2. Before any exam (written, practical, oral) student's identity will be checked (student's card, ID, passport). Without any of these documents, the student will not be allowed in the exam room.3. Any of type/ form of cheating is not allowed no matter what.4. Maintain silence during lectures and disturbance is not allowed.

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Course Plan of veterinary fungi and bacteria

X. - Information about Faculty Member Responsible for the Course:											
Name of Faculty Member	Hamid A. N. Alrefaiey					Office Hours					
Location & Telephone No.	Sana'a mobile: 775336921					SAT	SUN	MON	TUE	WED	THU
E-mail	Hamid77Ali@gmail.com nagihamidali@gmail.com					8am 2pm	8am 2pm	8am 2pm	8am 2pm	8am 2pm	-

XI. Course Identification and General Information:						
1-	Course Title:	General Bacteria and Fungi				
2-	Course Number & Code:	MI352				
3-	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2	-	1	3	
4-	Study level/year at which this course is offered:	Third year: second semester				
5-	Pre –requisite (if any):	MI352				
6-	Co –requisite (if any):	None				
7-	Program (s) in which the course is offered	Bachelor's degree (B. Sc.) Veterinary Medicine				
8-	Language of teaching the course:	English				
9-	System of Study:	Regular / Semester				
10-	Mode of delivery:	Lectures and Practical				
11-	Location of teaching the course:	Faculty of veterinary medicine				

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II. Course Description:

The course will introduce the student to the microbial world and the relationship of that world with the environment, animal, bird, and human health. Students should develop an appreciation for the ubiquity, longevity and importance of bacterial and fungal species. Students should elicit solutions for different veterinary bacterial and fungal problems. The structure of the course is based on presenting the fundamental characteristics bacterial and fungal species (growth, metabolism, reproduction, nutrition, cultivation, and identification); pathogenicity of different veterinary bacteria and fungi And their virulence factors and antimicrobial resistance; different methods for Diagnosing different veterinary bacterial and fungal infections.

II. Intended learning outcomes (ILOs) of the course:

After completing this course, students will be able to:

- a1- Describe the nature, classification, morphology and structure of bacterial and fungal cells.
- a2- Recognize growth requirements, physiology, reproduction and products of bacteria and fungi.
- b1- Differentiate between different bacterial and fungal pathogens.
- b2- Select the suitable sample and the suitable laboratory test for diagnosis.
- c1- Collect, preserve and transport samples from animals, poultry and fish for microbiological examination.
- c2- Prepare different types of culture media, obtain pure culture and describe colonies' morphology.
- d1- Working in team (i.e., sharing presentations and discussions and solving problem).
- d2- Reporting of the facts using printable sheets in the field of animal bacteriology and mycology.

V. Course Content:

A – Theoretical Aspect:

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Order	Topics List	Week Due	Contact Hours
1	- introduction and classification of bacteria	1	2
2	Gram positive cocci; Staphylococci	2	4
3	Gram positive cocci; Streptococci	3	2
4	Gram Positive; Genus Bacillus, G. Listeria	4	2
5	Gram Positive bacillus; Genus clostridium	5	2
6	Gram Positive cocci and rods ; Corynebacteria, Nocardia, Actinomyces Mycobacterium	6,7	4
7	Mid exam	8	2
8	Gram Negative bacteria: Enterobacteriaceae	9	2
9	Gram Negative bacteria; Pasteurella species, Mannheimia, genus Pseudomonas Actinobacillus	10	2
10	Gram Negative bacteria; Brucella, Francisella, Burkholderia, Taylorella	11	2
11	Spiral bacteria	12	2
12	Mycoplasma, Chlamydia & Rickettsia	13	2
13	Fungal diseases ;Yeasts, aspergillus, Mycotoxins.	14	2
14	fungal diseases of various body systems	15	2
15	Final exam	16	2
Number of Weeks /and Units Per Semester		16	32

b- Training Aspect:

Order	Training Tasks	Week Due	Contact hours
1	Genus staphylococcus; Staphylococcus aureus on culture (Gram`s stain), biochemical characters of S.aureus, virulence of S.aureus.	1	2
2	Genus Streptococcus; Streptococcus species on culture (Gram`s stain), biochemical characters of streptococcus agalactia, virulence of S.agalactia, S. agalactiae in milk (Loeffler`s MB stain)	2	2

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3	Genus Bacillus; Bacillus anthracis on culture (Gram`s stain), biochemical characters of B. anthracis , virulence of B. anthracis.	3	2
4	Genus clostridium; clostridium species , C. welchii(perfringens) on culture (Gram`s stain), biochemical characters and virulence of C. welchii	4,5	4
5	Corynebacteria on culture (Gram`s stain), biochemical characters and virulence of Corynebacterium.	6	2
6	Enterobacteriaceae on culture (Gram`s stain), biochemical characters and virulence of salmonella	7	2
7	Mid exam	8	2
8	Enterobacteriaceae on culture (Gram`s stain), biochemical characters and virulence of E. coli	9	2
9	Genus Brucella ; Brucella species biochemical characters Brucella species on culture.	10	2
10	Pseudomonas aeruginosa on culture (Gram`s stain), biochemical characters and virulence of P. aeruginosa	11	2
11	Genus mycobacterium; Mycobacterium species in sputum (Ziehl-Neelsen stain)	12	2
12	P. multocida in blood/tissue film (Leishman's stain)	13	2
13	Yeasts on culture (Gram`s stain).	14	2
14	Diagnosis of fungal diseases; Dermatophytes, aspergillosis.	15	2
15	Final exam	16	2
Number of Weeks /and Units Per Semester		16	32

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V. Teaching strategies of the course:

- Lectures depending on the sharing efforts of the students and supported with macromedia and multimedia aids.
- Training in the laboratory
- Self-learning (Electronic learning, Seminars, scientific search on related websites, international, national and local journals, related books in faculty library).
- Summer training course.
- Assays and reviews.
- Discussion groups.
- Group work
- Problem Solving
- Assignments
- Brainstorming
- Log book
- Field visits

VI. Assessment Methods:

- Written examination: For assessment of knowledge, back calling and Intellectual skills.
 - Practical examination: For assessment of practical and professional skill.
 - Oral examination: For assessment of knowledge and Intellectual skills.
- Student activities: For assessment of knowledge and general and transferable skills.

No.	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Participation, quizzes and assignments	2-14	10	10%
2	Mid-Term Exam	8	10	10%
3	Mid-Term Practical Exam	8	10	10%
4	Final Practical Exam	13	10	10%
5	Oral Exam	13	5	5%
6	Final Exam	16	55	55%
Total			100	100%

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II. Learning Resources:

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1- Required Textbook(s) (maximum two).

-Veterinary Microbiology and Microbial Diseases, 2002, Quinn etal.
 - Essentials of Veterinary Microbiology, 5th ed.,1995 , Carter etal.

2- Essential References.

-Oanne Willey, Stanley Fischer, and Richard Startz. 2010. Prescott’s Microbiology 8th edition. McGraw-Hill Higher Education.
 -Baxter, A. P and E. Van der Linde (Eds.). 1999. Collecting and preserving fungi: A manual for mycology. A Plant Protection Research Institute, South Africa. Ultra Litho (Pty) Ltd, Heriotdale, Johannesburg

3- Electronic Materials and Web Sites etc.

- Journals, Websitesetc Journals 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
 - 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](http://www.Immunology_and_Immunopathology) Intrnational of veterinary information services (IVIS)
 - www.Vet.net.com
 -<http://microbiologyonline.org/>
 -<http://www.microbiologybook.org/>

II. Course Policies:

1	Class Attendance:
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	MANDATORY TO ATTEND ALL COURSE LECTURES
2	Tardy: Not allowed at all. Students must be in class 10 minutes prior to the beginning of lectures.
3	Exam Attendance/Punctuality: Attendance is mandatory; absence is accepted with valid excuse.
4	Assignments & Projects: All assignments and projects are to be submitted on their due date. Any assignment turned in after the due date will not be accepted without valid and reasonable excuse.
5	Cheating: Not tolerated and may lead to EXPELLING the student from the program
6	Plagiarism: Not tolerated AT ALL and may lead to EXPELLING the student from the program
7	Other policies: <ol style="list-style-type: none"> 1. All devices must be on silent or at least on vibration during lectures/labs 2. Before any exam (written, oral) we must check student's identity (student's card, ID, passport). Without any of these documents, the student will not be allowed in the exam room. 3. Any of type/ form of cheating is not allowed no matter what 4. Maintain silence during lectures/exam and disturbance is not allowed. For any questions students should raise their hand and wait for permission to talk.

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