City University of Hong Kong
Course Syllabus

offered by Department of Biomedical Sciences
with effect from Semester A 2020/21

Part I Course Overview

Course Title:	Veterinary Microbiology
Course Code:	BMS2804
Course Duration:	One Semester
Credit Units:	3 credits
Level:	B2
Proposed Area: *(for GE courses only)*	☐ Arts and Humanities ☐ Study of Societies, Social and Business Organisations ☐ Science and Technology
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	Completion of all Year 1 courses with C grade or above
Precursors: *(Course Code and Title)*	Nil
Equivalent Courses: *(Course Code and Title)*	Nil
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

(A 150-word description about the course)

This course aims to:

- provide a broad introduction to the diversity of microorganisms including archaea, bacteria, fungi, protists and viruses and what they do in the world at large, in soils, air and waters, but with a strong emphasis on their role as symbionts and pathogens in the animal body;
- develop students' discovery attitude about microbes, skills at searching for and presenting information related to microbiology in clear and concise English;
- develop student skills to apply a problem-based learning approach to study microbiology events in our daily lives; and
- develop skills in basic microbiological techniques including culturing, smearing, staining, and antibiotic sensitivity testing.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs[#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Identify and describe the diversity of archaea, bacteria, fungi, protists, viruses and their habitats and analyze the environmental factors that affect their growth.		✓		
2.	Identify and discuss the importance of microorganisms in and their role in the underlying basis of disease in a wide range of species and animal industries including impacts on public health (AVCB, RCVS).			✓	✓
3.	Discover the different roles of microbes in our daily lives and apply basic microbiology concepts to solve daily problems related to microbiology issues.				✓
4.	Describe, compare and contrast the different agents and methods for control of microbial growth used *in vitro* and in the development of appropriate treatment plans for animals (RCVS).		✓		
5.	Gather and appraise information relating to microbiology, analyze and identify important messages from such information and present them in clear and concise English.			✓	
6.	Implement basic microbiological techniques in a laboratory setting			✓	
** If weighting is assigned to CILOs, they should add up to 100%.*		100%			

[#] *Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.*

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.

A3: *Accomplishments*
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3	4	5	6	
Lectures and tutorials	Teaching and learning will be primarily based on interactive lectures and tutorials with activities designed to develop the discovery attitude in relation to microbes' role in animals and in our daily lives, along with complementary in-class and on-line discussions where students will be able to be involved in small group sharing, so they can learn to describe and discuss the related subject matters.	✓	✓	✓				2 hours every week
"Ask a Question" exercise, written assignments and scientific journal article review	Appropriate "Ask a Question" exercise, written assignments, scientific journal article review will be implemented for the students to develop their appraisal, analytical and oral and written communication skills.				✓			1 hour every second week
Problem-based learning activities and oral presentations	Problem-based learning activities and oral presentations will be organised for the students to practise their skills in identification of learning issues, analysis and synthesis of collected information, application of synthesised information to solve problems and presentation.				✓	✓		1 hour every second week
Laboratory classes	Implement basic microbiological techniques in a laboratory setting including culturing, smearing, staining, and antibiotic sensitivity testing.						✓	2 hours every second week

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.						Weighting*	Remarks
	1	2	3	4	5	6		
Continuous Assessment: 50%								
Tests	✓	✓	✓				5%	
Written assignments, scientific journal article review	✓	✓	✓	✓			10%	
PBL contribution, including oral presentations					✓		15%	
"Ask a Question" activity, in-class and online discussions, including discovery activities	✓	✓	✓	✓			15%	
Laboratory techniques						✓	5%	
Examination: 50% (duration: 3 hours)								
** The weightings should add up to 100%.*							100%	

"Minimum Passing Requirement" for BVM courses:

A minimum of 30% in coursework as well as in examination, and the total minimum passing requirement for the whole BVM course is 50%.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Tests	To verify the stat of students' learning progress	High competence	Good competence	Basic competence	Some deficiencies	Lack of competence
2. Written assignments, scientific journal article review	Encourage students to think critically by allowing them to review and criticize the current scientific article	High competence	Good competence	Basic competence	Some deficiencies	Lack of competence
3. PBL contribution, including oral presentations	To challenge students to collaborate communicate and working together to solve problem as a team	High competence	Good competence	Basic competence	Some deficiencies	Lack of competence
4. "Ask a Question" activity, in-class and online discussions, including discovery activities	Ability to understand the materials in lectures and asking questions from critical thinking	High competence	Good competence	Basic competence	Some deficiencies	Lack of competence
5. Laboratory techniques	Ability to produce a usable Gram stain and to plate uncontaminated colonies	High competence	Good competence	Basic competence	Some deficiencies	Lack of competence
6. Examination	To test students' application of material taught in class and evaluate their performance	High competence	Good competence	Basic competence	Some deficiencies	Lack of competence

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

1. Microbial diversity of archaea, bacteria, fungi, protists, viruses
   - physiological diversity (chemoorganotroph, chemolithotroph, phototroph, heterotroph, autotroph)
   - microbial systematics (phenotypic, genotypic, phylogenetic analysis)

2. Microbial growth
   - exponential growth
   - measuring microbial growth
   - environmental factors affecting growth

3. Microbial ecology
   - methods in microbial ecology (isolation, T-RFLP, DGGE)
   - how microbes interact with each other
   - descriptions of major microbial habitats
   - biofilms

4. The roles of microorganisms in animal health and disease, and in food safety

5. Microbial interactions with animals
   - normal microbial flora
   - microbial diseases (airborne, vectorborne, waterborne, foodborne, direct contact transmitted)

6. Microbial growth control
   - physical antimicrobial control
   - chemical antimicrobial control
   - antimicrobial drugs, in particular antibiotics and their mode of action

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	D. Scott McVey, Melissa Kennedy, M. M. Chengappa (2013). *Veterinary Microbiology* (3rd edition). Wiley-Blackwell.

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	J.W. Deacon (2006). *Fungal Biology*. Blackwell Publishing Limited.
2.	Michael T. Madigan, John M. Martinko, David Stahl and David P. Clark (2010). *Brock Biology of Microorganisms, 13th ed.* Benjamin Cummings.
3.	Timoney, J., Gillespie, J., Scott, F., and Barlough, J. (2009). *Hagan and Bruner's Microbiology and Infectious Diseases of Domestic Animals.*
4.	Nikam, P. (2013). *Veterinary Microbiology: Bacterial and Fungal Agents of Animal Disease.*