

# **Department of Microbiology**

## **BS. Veterinary Microbiology Scheme of Study**



**Faculty of Allied Health Sciences**  
**Health Services Academy (HSA) Park Road, Islamabad**

# **BS VETERINARY MICROBIOLOGY**

## **1. Overview of the program**

Veterinary microbiology is concerned with the study of medical diagnostics and well-being, as well as the treatment of all species of animals.

- Veterinary microbiology specializes in the study of microorganisms that cause infectious illnesses in animals.
- It contributes to study and solutions for animal ailments.
- Veterinary microbiologists have a variety of activities and responsibilities, including studying animal tissues and fluids, contributing to the creation of vaccinations, medications, and other animal health products, and so on.

## **2. Program Objectives**

- **Learning Experience:** It prepares applicants to detect a variety of deadly and infectious diseases caused by bacteria and viruses.
- **Industry Preparedness:** The purpose of this course is to assist with study, prevention, and management of multiple diseases caused by various microorganisms in domesticated animals.
- The course teaches students how to analyze and treat numerous diseases in furry animals.
- Graduates can pursue careers in research or as veterinary pathologists.

## **3. Core values**

- ❖ Perform integrated interdisciplinary teaching and research with the highest level of ethics and professionalism, to meet the needs of stakeholders; and be responsive to changing global trends.
- ❖ Promote and defend the freedom of thought, academic enquiry, expression and association.
- ❖ Demonstrate sensitivity to student welfare and staff needs, and to practice environmental stewardship to the highest standards.

#### **4. Jobs and placements**

Veterinary science is concerned not only with the treatment of animals, but also with the scientific breeding and breeding of animals. Veterinarians prevent the spread of diseases and perform procedures on animals by administering immunizations and medications on time.

Many job roles such graduates can consider are:

- I. Veterinarian Technician
- II. Corporate Veterinary medicine including the pharmaceutical industry or corporations that produce animal-related products
- III. Veterinarian Physician
- IV. Private or public animal welfare agencies ensuring health and wellbeing of animals
- V. Veterinarian Assistant
- VI. Veterinary Pharmacologist
- VII. Agricultural industries, animal health, inspection, environmental quality
- VIII. Veterinary Epidemiologist
- IX. Veterinary Dermatologist
- X. Associate Veterinarian
- XI. Veterinary Food Inspection Specialist
- XII. Companion Animal Veterinarian

#### **5. Core activities**

- ❖ The institute instructs in Veterinary microbiology.
- ❖ The institute trains Undergraduate students in Veterinary Microbiology in the four years' degree program.
- ❖ In addition, the institute also invests in preparing active future Veterinary Microbiologist, *researchers and teachers*.
- ❖ It engages its students in activities ranging from *optimization of laboratory protocols and animal handling to poster & oral presentations and critical reviews*.
- ❖ The institute arranges *research days and conferences* throughout the year, in which the new inductees are given an opportunity to develop an orientation regarding the core activities and structure of the department while the current students present their posters and critical reviews and receive feedback from the faculty members of different departments.
- ❖ Furthermore, students assessed for their understanding and application of knowledge through both *formative and summative assessments*.

#### **6. Teaching and Learning Methods**

Students will experience a wide variety of teaching and learning methods from expert staff including *tutorials, lectures, seminars, workshops, small group discussions, and problem-based learning, and laboratory sessions*. As such the students will develop a wide range of

skills useful in basic and applied environment. These skills will aid in *teamwork, scientific exploration, and problem solving and identifying relevant laboratory protocols.*

## 7. Assessment Methods

Students will be assessed both *formatively and summative*. Throughout the year formative assessment in the form of class tests, presentations and assignments along with the feedback will be carried out. Summative assessment will include end of the course terminal exam featuring multiple-choice questions. The practical aspects will be assessed using viva and Objective structured Practical examination (OSPE).

## 8. Registration in the Health Services Academy

- ❖ Registrar of the university shall maintain a register of BS Veterinary Microbiology through Admission Test and Open Merit list of HSA.
- ❖ A "notification of registration" for each candidate approved /allowed for admission to BS program shall be issued by the University.
- ❖ Registration may be renewed on payment of the prescribed fee if a scholar is re-admitted within a year after having been struck off the rolls for any valid reason.
- ❖ A person registered for the BS degree program shall be called Veterinary Microbiologist. Each student so selected shall be required to register and pay the dues within 30 days from the date of issuance of the notification of registration, failing which the admission of the selected candidate shall be deemed as cancelled. The university shall determine the tuition fee and other dues from time to time.

## 9. Mentors

The students shall select their teaching mentor in the first year and research mentor at the end of last year. The coordinator shall serve as mentor before selection of mentors.

## 10. Student Assessment Methods

- |                                 |                                       |
|---------------------------------|---------------------------------------|
| a. Class quiz                   | to assess continuous learning process |
| b. Mid and terminal examination | to assess learning outcomes           |
| c. Presentations                | to assess communication skills        |
| d. Assignments                  | to assess writing skills              |

## 11. Weighting of assessments for each course      Total marks=100

Midterm exam	20
Terminal examination	50
Oral/practical examination	10
Presentations/Assignment	10
Class quizzes	10
<b>Total</b>	<b>100</b>

## 12. Frame work of the program as per Under Graduate Policy, 2023

Nature	Courses	Credit Hours
<b>General Education Courses</b>	Functional English	3+0=3
	Information and communication Technologies ICT	2+1=3
	Ideology and Constitution of Pakistan	2+0=2
	Islamic studies/Ethics	2+0=2
	Natural Sciences	2+1=3
	Quantitative reasoning - I	3+0=3
	Social sciences	2+0=2
	Quantitative reasoning II	3+0=3
	Arts and Humanities	2+0=2
	Expository writing	3+0=3
	Civics and community engagement	2+0=2
	Entrepreneurship	2+0=2
		<b>30 credit hours</b>
<b>Major (Disciplinary) Courses</b>	Introduction to veterinary microbiology	3+0=3
	Veterinary Pathology	2+1=3
	Veterinary Pharmacology and Toxicology	3+0=3
	Animal Nutrition	3+0=3
	Introductory Veterinary Pathogenesis	3+0=3
	Veterinary Anatomy	2+1=3
	Veterinary Physiology	2+1=3
	Veterinary Parasitology	2+1=3
	Systematic Veterinary Bacteriology	2+1=3
	Systematic Veterinary Mycology	2+1=3
	Systematic Veterinary Virology	2+1=3
	Veterinary Gynecology and Obstetric	3+0=3
	Animal Genetics and Breeding	3+0=3
	Veterinary Medicine	3+0=3
	Veterinary Clinical Practices	2+1=3
	Livestock Production Management	3+0=3
	Livestock Products Technology	3+0=3
	Veterinary Radiology and Surgery	2+1=3
	Principles of Animal Diseases and Prevention I	2+1=3
	Principles of Animal Diseases and Prevention II	2+1=3
	Antibiotics and Alternatives for animals	3+0=3
	Molecular Basis of Symbiosis and Microbiomes	3+0=3
	Disease Ecology and Epidemiology	3+0=3
Public Health and the Role of the Veterinary Profession	2+1=3	
	<b>72 credit hours</b>	
<b>Interdisciplinary/Allied Courses</b>	Fundamentals of microbiology	3+0=3
	Microbial taxonomy	3+0=3

	Principles of Biochemistry	2+1=3
	General immunology	2+1=3
	Microbial anatomy and physiology	3+0=3
	Molecular cell biology	3+0=3
	Zoonosis	2+1=3
	Microbial genetics	2+1=3
	Bioinformatics	2+1=3
	Biosafety and biosecurity	3+0=3
		<b>30 credit hours</b>
<b>Field Experience/Internship</b>		<b>0+3=3</b>
<b>Capstone Project</b>		<b>0+3=3</b>

### Scheme of Studies for BS Veterinary Microbiology (4 Years)

- Eligibility F.Sc. premedical /A-level/12 years (equivalent) of schooling with science subjects (Biology, Chemistry and Physics) with at least 50% marks in aggregate.
- Total numbers of Credit hours 138 (HEC recommended: 120- 140)
- Duration 4 years
- Semester duration 16-18 weeks
- Semesters 8
- Course Load per Semester 15-18 Credit hours

Semester	Name of Subject	Credits	Pre-requisite
<b>First</b>	Functional english	3+0=3	
	Information and communication technologies ICT	2+1=3	
	Ideology and constitution of Pakistan	2+0=2	
	Principles of biochemistry	2+1=3	
	Fundamentals of microbiology	3+0=3	
	Microbial taxonomy	3+0=3	
	<b>Total credit hours</b>	<b>17</b>	
<b>Second</b>			
	Islamic studies/ethics	2+0=2	
	Natural sciences	2+1=3	
	Quantitative reasoning - I	3+0=3	
	Social sciences	2+0=2	
	Microbial anatomy and physiology	3+0=3	
	Molecular cell biology	3+0=3	
	<b>Total credit hours</b>	<b>16</b>	
<b>Third</b>			
	Quantitative reasoning II	3+0=3	Quantitative reasoning - I
	Arts and humanities	2+0=2	
	Zoonosis	2+1=3	
	Microbial genetics	2+1=3	
	General immunology	2+1=3	
	Biosafety and biosecurity	3+0=3	
	<b>Total credit hours</b>	<b>17</b>	
<b>Fourth</b>			

	Expository writing	3+0=3	
	Civics and community engagement	2+0=2	
	Entrepreneurship	2+0=2	
	Bioinformatics	2+1=3	
	Introduction to veterinary microbiology	3+0=3	
	Veterinary anatomy	2+1=3	
	<b>Total credit hours</b>	<b>16</b>	
<b>Fifth</b>			
	Introductory veterinary pathogenesis	3+0=3	
	Systematic veterinary bacteriology	2+1=3	
	Veterinary pharmacology and toxicology	3+0=3	
	Animal nutrition	3+0=3	
	Veterinary physiology	2+1=3	
	Veterinary parasitology	2+1=3	
	<b>Total credit hours</b>	<b>18</b>	

<b>Sixth</b>			
	Veterinary pathology	2+1=3	
	Systematic veterinary mycology	2+1=3	
	Systematic veterinary virology	2+1=3	
	Veterinary Gynecology and Obstetric	3+0=3	
	Animal Genetics and Breeding	3+0=3	
	Veterinary medicine	3+0=3	
	<b>Total credit hours</b>	<b>18</b>	
<b>Seventh</b>			
	Veterinary clinical practices	2+1=3	
	Livestock production management	3+0=3	
	Livestock products technology	3+0=3	
	Veterinary Radiology and Surgery	2+1=3	
	Principles of Animal Diseases and Prevention I	2+1=3	
	Molecular Basis of Symbiosis and Microbiomes	3+0=3	
	<b>Total credit hours</b>	<b>18</b>	
<b>Eight</b>			
	Principles of Animal Diseases and Prevention II	2+1=3	
	Antibiotics and Alternatives for animals	3+0=3	
	Disease Ecology and Epidemiology	3+0=3	
	Public Health and the Role of the Veterinary Profession	2+1=3	
	Research project	0+3=3	
	<b>Total credit hours</b>	<b>15</b>	

Internship	0+3=3	In summer after 4 <sup>th</sup> semester
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**Total Course Credit Hours = 138**