

**Dairy Science Park – Sandia National Laboratories USA Collaboration**  
**Pakistan’s BRM Curriculum Development**  
**DVM National Curriculum**

DVM Semester	BRM Courses Integration	BRM Knowledge Level
Semester 1:	<i>No integration</i>	
Semester 2:	<ul style="list-style-type: none"> <li>General Veterinary Microbiology (<b>Basic concepts of biosafety/biosecurity *BS&amp;S in microbiology lab practical session</b>)</li> </ul>	<ul style="list-style-type: none"> <li>Introduction to the BS&amp;S, relevant terminologies and required examples <i>During</i> Lab practical <ul style="list-style-type: none"> <li>1 contact hour required</li> </ul> </li> </ul>
Semester 3:	<ul style="list-style-type: none"> <li>General Veterinary Pathology (<b>Basic concepts on sample collection and sample transportation</b>)</li> <li>Molecular Biology (<b>BRM intro – AMP model –basics only</b>)</li> </ul>	<ul style="list-style-type: none"> <li>Basic sample collection and transportation concepts <i>During</i> the Practical session of tissue processing through adding dual use of research project ideas. <ul style="list-style-type: none"> <li>1 contact hour required</li> </ul> </li> <li>Intro to BRM and basics AMP model <ul style="list-style-type: none"> <li>1 contact hour required</li> </ul> </li> </ul>
Semester 4:	<ul style="list-style-type: none"> <li>Livestock Feed Resources and Forage Conservation (<b>BRM Risk Assessment, basics of hazards/threats Identification and risk characterization process</b>)</li> <li>Veterinary Bacteriology and Mycology (<b>Basic concepts of Good Lab Work Practices *GLWP and Personal Protective Equipment *PPE</b>)</li> <li>Systemic Veterinary Pathology (<b>Intro to SOPs development and Basic concepts of Decontamination process</b>)</li> </ul>	<ul style="list-style-type: none"> <li>BRM Risk Assessment process with basic concepts of hazards/threats Identification and risk characterization <i>During</i> Theory session <ul style="list-style-type: none"> <li>1 contact hour required</li> </ul> </li> <li>Basic intro to Good Lab Work Practices *GLWP and Personal Protective Equipment *PPE <i>During</i> Practical session <ul style="list-style-type: none"> <li>2 contact hours required</li> </ul> </li> <li>Introduction to SOPs development and basic concepts of spill kits/Decontamination process <i>During</i> Practical session <ul style="list-style-type: none"> <li>1 hour contact hour required</li> </ul> </li> </ul>
Semester 5:	<ul style="list-style-type: none"> <li>Veterinary Clinical Pathology (<b>Risk Assessment –hazard/threats identification process and Risk communication</b>)</li> <li>Veterinary Virology (<b>Intro to Biocontainment facilities</b>)</li> </ul>	<ul style="list-style-type: none"> <li>Intermediate Risk assessment – hazards/threats identification process and Risk Communication <i>During</i> practical session <ul style="list-style-type: none"> <li>1 contact hour required</li> </ul> </li> <li>Introduction to the concept of risk</li> </ul>

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	<ul style="list-style-type: none"> <li>• Islamic Studies/Ethics (<b>Bioethics</b>)</li> </ul>	<p>group organisms, Biocontainment facilities and BSL levels <i>During</i> Theory and Practical session</p> <ul style="list-style-type: none"> <li>○ 1 contact hour required</li> </ul> <ul style="list-style-type: none"> <li>• Introduction to the Bioethics Concepts <i>During</i> Theory session</li> <li>○ 1 contact hour required</li> </ul>
<b>Semester 6:</b>	<ul style="list-style-type: none"> <li>• Medicine Clinic-I (<b>Basic Field Biosecurity and Characterization of Waste Disposal</b>)</li> <li>• Theriogenology Clinic – I (<b>Animal health worker’s safety and security</b>)</li> <li>• Zoonoses and Food Safety (<b>Planning and Assessment- 6 topics from policy planning of BRM</b>)</li> <li>• Meat Inspection and Necropsy Practice (<b>Intro to PPE, Bio Waste management and disposal, Documentation and proper reporting for QA/QC</b>)</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction to the basics of Field Biosecurity and the characterization of biological wastes disposal <i>During</i> Clinical session</li> <li>○ 1 contact hour required</li> <li>• Introduction to animal health worker’s safety and security <i>During</i> Clinical session</li> <li>○ 1 contact hour required</li> <li>• Basic introduction to the concepts of BRM Planning and Assessment <i>During</i> Practical session</li> <li>○ 1 contact hour required</li> <li>• Introduction to the concepts of PPE, Waste management system, Documentation and proper reporting for QA/QC in meat inspection and Necropsy practices.</li> <li>○ 2 contact hours required</li> </ul>
<b>Semester 7:</b>	<ul style="list-style-type: none"> <li>• Veterinary Preventive Medicine-II (<b>Developing need assessment and building Human capacity for BRM</b>)</li> <li>• Medicine Clinic-II (<b>Incident Management and Response</b>)</li> <li>• Theriogenology Clinic – II (<b>Evaluate Human performance for BRM in Lab</b>)</li> <li>• Beef and Mutton Production</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction to Developing need assessment and building Human capacity for BRM <i>During</i> Theory session</li> <li>○ 1 contact hour required</li> <li>• Introduction/demo to the concepts of Incident Management and response <i>During</i> Practical session</li> <li>○ 1 contact hour required</li> <li>• Human performance evaluation in BRM Lab <i>During</i> Theory and Practical</li> <li>○ 1 contact hour required</li> </ul>

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	<i>(Developing SOPs for food processing facilities)</i>	<ul style="list-style-type: none"> <li>• Developing biosafety SOPs for food processing facilities <i>During</i> Practical session <ul style="list-style-type: none"> <li>○ 1 contact hour required</li> </ul> </li> </ul>
<b>Semester 8:</b>	<ul style="list-style-type: none"> <li>• Veterinary Epidemiology and Public Health (<b><i>BRM principles used in Epidemiology and Public Health field</i></b>)</li> <li>• Medicine Clinic III (<b><i>Evaluating, measuring and improving overall BRM performance</i></b>)</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction to BRM principles used in Epidemiology and Public Health Field <i>During</i> Theory session <ul style="list-style-type: none"> <li>○ 1 contact hour required</li> </ul> </li> <li>• Evaluating, measuring and improving overall BRM performance in clinic settings based on available standards <i>During</i> Practical session <ul style="list-style-type: none"> <li>○ 1 contact hour required</li> </ul> </li> </ul>
<b>Semester 9:</b>	<ul style="list-style-type: none"> <li>• Poultry Pathology (Lab design principles for implementation of BRM)</li> <li>• Medicine Clinic-IV (<b><i>Basic/Preliminary Administrative control for BRM</i></b>)</li> </ul>	<ul style="list-style-type: none"> <li>• Basic introduction to the concepts of Lab design principles for implementation of BRM <i>During</i> Practical session <ul style="list-style-type: none"> <li>○ 2 contact hour required</li> </ul> </li> <li>• Basic/Preliminary introduction to the Administrative control for BRM <i>During</i> Clinics session <ul style="list-style-type: none"> <li>○ 1 contact hour required</li> </ul> </li> </ul>
<b>Semester 10:</b>	<b><i>No integration</i></b>	

**Contact:**

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