Course Information.
Master of Science Program in Veterinary Microbiology
Improved Curriculum Year 2556.

Curriculum Framework
Number of Credits The curriculum consists of 36 credits

A. Core Courses (วิชาเอก) at least 24 Credits
   - Seminar 2 Credits
   - Core Compulsory (วิชาเอกบังคับ) 7 Credits
   - Elective Courses (วิชาเอกเลือก) at least 15 Credits

B. Thesis at least 12 Credits

Total 36 Credits

Curriculum
A. Core Courses at least 24 Credits

   Seminar 2 Credits
01508597 Seminar 1,1

- Core Compulsory 7 Credits
01508551 Intensive Veterinary Microbiology 2(2-0-4)
01508552 Integrated Virology and Immunology 3(3-0-6)
01508591 Research Methods in Veterinary Microbiology 2(2-0-4)

- Elective Courses (วิชาเอกเลือก) at least 15 Credits

At least 6 credits are selected from this list and 9 more additional credits are selected from other graduate programs.
01508511 Foodborne Microbial Pathogens 2(2-0-4)
01508512 Bacterial Infectious Diseases of Aquatic Animals 3(3-0-6)
01508513 Bacteria-host Interactions and Disease Prevention 2(2-0-4)
01508521 Fungal Infectious Diseases of Aquatic Animals 3(3-0-6)
01508531 Viral Infectious Diseases of Aquatic Animals 3(3-0-6)
01508532 Molecular Virology 3(3-0-6)
01508541 Immunity and Immunopathobiology 3(3-0-6)
01508542 Immunity and Vaccine in Aquatic Animals 3(3-0-6)
01508543  Molecular Immunology  3(3-0-6)  
01508544  Vaccinology  2(2-0-4)  
01508553  Clinical Microbiology Diagnosis  2(1-3-4)  
01508596  Selected Topics in Veterinary Microbiology  1-3  
01508598  Special Problems  1-3  

B. Thesis (วิทยานิพนธ์) at least 12 Credits  
01508599  Thesis  1-12  

Course Description  

01508511  Foodborne Microbial Pathogens  2(2-0-4)  
Foodborne microbial pathogens, detection, surveillance, outbreak investigation, prevention and control.  

01508512  Bacterial Infectious Diseases of Aquatic Animals  3(3-0-6)  
Characteristics of bacteria, mechanisms of infection and bacterial diseases of aquatic animals, identification, epidemiology and control.  

01508513  Bacteria-host Interactions and Disease Prevention  2(2-0-4)  
Principle of bacterial diseases in humans and animals. The interaction between bacterial pathogens and host cells at a molecular level. Immunology of the host defense, virulence mechanisms and bacterial infection. Diagnostic tools, vaccines and antimicrobials for prevention and control.  

01508521  Fungal Infectious Diseases of Aquatic Animals  3(3-0-6)  
Characteristics of fungi, mechanisms of infection and fungal diseases of aquatic animals, identification, epidemiology and control.  

01508531  Viral Infectious Diseases of Aquatic Animals  3(3-0-6)  
Characteristics of viruses, mechanisms of infection and viral diseases of aquatic animals, identification, epidemiology and control.  

01508532  Molecular Virology  3(3-0-6)  
Molecular structure, molecular mechanisms of virus entry, replication, regulation of viral gene expression, and viral assembly and release, cell transformation and apoptosis, viral trafficking and evolution, antiviral drugs and viral vector.  

01508541  Immunity and Immunopathobiology  3(3-0-6)  
Mechanism of immune response, immune-tolerance, immune cell migration, host response to infection, alimentary and respiratory mucosal immunity, tumor immunity, immune reaction to tissue
transplantation. Hypersensitivity, autoimmune and monodeficiency.

**01508542  Immunity and Vaccine in Aquatic Animals**  3(3-0-6)
Immune system of aquatic animals, immunization, categories, preparation and use of vaccines in animals for prevention of bacterial and viral diseases.

**01508543  Molecular Immunology**  3(3-0-6)
Molecular structure of immune cells, mechanisms of specific immune response, intracellular signaling pathways, and control mechanism of immune system.

**01508544  Vaccinology**  2(2-0-4)
Principle of vaccination, adjuvants, conventional vaccine production, production of genetic or genetic-modified organism vaccines, immune response to vaccines, quality and safety control, future trend of vaccine.

**01508551  Intensive Veterinary Microbiology**  2(2-0-4)
Structure and function, taxonomy, genetics, nutrient requirements, metabolism and growth of microbes. Microbial controls and control mechanisms, mechanisms of microbial infection and pathogenesis in the host, and concepts in diagnosis of microbes and infections.

**01508552  Integrated Virology and Immunology**  3(3-0-6)
Classification, molecular structure, cellular entry, replication and gene expression of virus. Molecular structure and pathogenesis of prion, antiviral drugs, cells and molecules of immune system, innate immunity and pathogen sensors, antigen recognition, adaptive immunity response, immune response to viral infection, interaction between virus and immune response.

**01508553  Clinical Microbiology Diagnosis**  2(1-3-4)

**01508591  Research Methods in Veterinary Microbiology**  2(2-0-4)
Research principles and methods in veterinary microbiology, identification and analysis of problem for setting hypothesis of research, research designs, research proposal writing, data collection, analysis, interpretation and compile to a written report.

**01508596  Selected Topics in Veterinary Microbiology**  1-3
Selected topics in veterinary microbiology at the master’s degree
level. Topics are subjected to change each semester.

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>01508597</td>
<td>Seminar</td>
<td>1</td>
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<tr>
<td></td>
<td>Presentation and discussion on current interesting topics in veterinary microbiology at the master’s degree level.</td>
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<tr>
<td>01508598</td>
<td>Special Problems</td>
<td>1-3</td>
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<tr>
<td></td>
<td>Study and research in veterinary microbiology at the master’s degree level and compile to a written report.</td>
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<tr>
<td>01508599</td>
<td>Thesis</td>
<td>1-12</td>
</tr>
<tr>
<td></td>
<td>Research at master’s degree level and compile into a thesis.</td>
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