

MASTER DEGREE PROGRAM IN ANIMAL HEALTH & BIOMEDICAL SCIENCES

Academic program: two-year program

Admission: interview:

Qualification of Applicants

1. An applicant must have Doctor of Veterinary Medicine, or
2. Bachelor of Science of related fields

Three programs are offered

1. *Plan A1 Thesis program*

Students must complete 5 credits of course works and 36 credits for a thesis.

2. *Plan A2 Thesis program*

Students must complete 24 credits of course works and 12 credits for a thesis

Students of both Thesis programs must have one publication in international journal or a presentation at international conferences

3. *Plan B Non-thesis program*

Students must complete 24 credits of course works and 6 credits for independent study. For initial stage this program provides only Thai applicants.

Examinations

Students must pass comprehensive and defending examinations to complete his/her degree.

STUDY PLANS

Total credits for master degree program are 36.

Plan A1 Thesis program

Courses	Credits
THE FIRST YEAR <i>The first semester</i>	
01542591 Research Methodology in Animal Health and Biomedical Sciences	(3)*
01542599 Thesis	3
THE FIRST YEAR <i>The second semester</i>	
01542597 Seminar	(1)*
01542599 Thesis	12
THE SECOND YEAR <i>The first semester</i>	
01542597 Seminar	(1)*
01542599 Thesis	12
THE SECOND YEAR <i>The second semester</i>	
01542599 Thesis	9
	<u>36</u>

()* attaining a class or classes with no credits

Plan A2 Thesis program

Courses	Credits
THE FIRST YEAR <i>The first semester</i>	
01542591 Research Methodology in Animal Health and Biomedical Sciences	3
01542531 Advanced Cellular Biochemistry in Animal	3
01542571 Biostatistics in Animal Health and Biomedical Sciences	3
Elective course	3
THE FIRST YEAR <i>The second semester</i>	
01542597 Seminar	1
01542599 Thesis	4
Elective course	6
THE SECOND YEAR <i>The first semester</i>	
01542597 Seminar	1
01542599 Thesis	4
Elective course	4
THE SECOND YEAR <i>The second semester</i>	
01542599 Thesis	4
	<u>36</u>

Plan B Non-Thesis program

Courses	Credits
THE FIRST YEAR <i>The first semester</i>	
01542591 Research Methodology in Animal Health and Biomedical Sciences	3
01542531 Advanced Cellular Biochemistry in Animal	3
01542571 Biostatistics in Animal Health and Biomedical Sciences	3
Elective course	3
THE FIRST YEAR <i>The second semester</i>	
01542597 Seminar	1
01542595 Independent study	3
Elective course	9
THE SECOND YEAR <i>The first semester</i>	
01542597 Seminar	1
01542595 Independent study	3
Elective course	7
THE SECOND YEAR <i>The second semester</i>	
Elective course	3
	<u>36</u>

Elective courses

Code	Course	Credits
01542511	Essence in Anatomy for Animal Health and Biomedical Sciences	3
01542521	Immunobiology	4
01542522	Molecular and Cellular Immunology	4
01542523	Emerging Bacterial Diseases and Current Status	2
01542532	Cell and Molecular Biology for Animal Health and Biomedical Sciences	2
01542541	Chemical and Mycotoxin Contaminations in Animal Production	2
01542542	Antimicrobial Use in Livestock	2
01542543	Research Instruments in Biomedical Science	2
01542544	Microbioassay for Antimicrobial in Biomedical Research	2
01542551	Cellular and Molecular Pathology	3
01542561	Biotechnology in Parasitology	3
01542562	Veterinary Diagnostic Techniques of Parasitic Diseases	2
01542572	Veterinary Public Health Management	2
01542573	Information System and Technology in Veterinary Public Health	2
01542581	Molecular Technology in Animal Health and Biomedical Sciences	3
01542596	Selected Topics in Animal Health and Biomedical Sciences	3
01542598	Special Problems	1

COURSE DESCRIPTION

Essence in Anatomy for Animal Health and Biomedical Sciences

Gross anatomy of organs in animal body systems, histology of the cell, tissues and organs, development of germ layers.

Immunobiology

Basic principles of immunobiology, organs of the immune system, innate immunity, antigen and antibody, cells and molecules of the immune system, cytokines and chemokines, antigen recognition, antigen processing and presentation, humoral and cell-mediated immune response, immunity to infection, immunopathobiology, immunodeficiency, graft rejection, tumor immunity.

Molecular and Cellular Immunology

Basic elements of the immune system, molecular biology of antigen recognition structures on innate immune cells and lymphocytes, cellular basis of immunity, inflammation and leukocyte

recruitment, cellular signaling, molecular biology of B and T cells, regulation of the immune system.

Emerging Bacterial Diseases and Current Status

Definitions and current concepts of emerging infectious diseases, host and pathogen characteristics and risk factors, analysis of environmental changes resulting in emerged pathogens, improper use of antimicrobials, multi-drug resistance pathogens, pathogenesis of emerging bacteria and emerging bacterial zoonoses and food-borne bacteria.

Cell and Molecular Biology for Animal Health and Biomedical Sciences

Structure and function of organelles, DNA replication, gene regulation and expression, protein synthesis, cell cycle, cell migration and cell signaling.

Advanced Cellular Biochemistry in Animal

Animal cell structure and function, generation and storage of metabolic energy and mechanisms of regulations, molecular biology, molecular biological techniques and application.

Chemical and Mycotoxin Contaminations in Animal Production

Characteristics and incidences of toxication, effects of chemical and mycotoxin contaminations on food chains in animal production and preventive measures.

Antimicrobial Use in Livestock

Types and properties antimicrobial, mechanisms of action, pharmaceutical bioequivalences, bioavailability, applications, regulation of antimicrobial use, incidence of resistance and environmental effects in livestock and aquatic animals

Research Instruments in Biomedical Science

Principles use of basic and specific laboratory instruments in biomedical research

Microbioassay for Antimicrobial in Biomedical Research

Principles and techniques in biomedical research; cell culture techniques; spectrometry, mass spectrometry; molecular biology techniques; immunological techniques; electrophoresis; chromatography; radioisotope techniques

Cellular and Molecular Pathology

Molecular pathological processes of cell and tissue, normal homeostasis and diseases

induction, cell death, acute and chronic inflammation, wound healing, repair, scar formation and aging, cellular and molecular mechanisms of cell injury, cellular responses to injury, inflammation, oxidative injury, hypersensitivity, and autoimmunity; mechanisms of carcinogenesis; pathogenesis and pathophysiology of viruses, bacteria, fungi and parasites, including toxin-mediated cellular injury.

Biotechnology in Parasitology

Application of biotechnology in study of parasitology, DNA analysis, DNA cloning, DNA sequencing, analysis of gene expression, determination of genetic mutation, DNA and RNA bioinformatics, protein bioinformatics, analysis of protein-protein interactions and of protein-nucleic acid interactions, genetic engineering and its applications for development of diagnostic kits and vaccines.

Veterinary Diagnostic Techniques of Parasitic Diseases

Molecular technique in detection of parasites, gold standard techniques for parasitic infection, new method for diagnosis of identify carriers or reservoir hosts and proteomic technique in diagnosis

Biostatistics in Animal Health and Biomedical Sciences

Data collection in animal health and biomedical sciences study, type of variables, management, descriptive and inferential statistics, central limit theorem, probability, sample size and sampling, confidence intervals, hypothesis testing, appropriate statistical analysis, *t*-test, analysis of variance, repeated measure ANOVA, simple linear regression and correlation, chi-squared test, non-parametric tests and relevant statistical softwares.

Veterinary Public Health Management

Management, development, administration, planning, and project management in veterinary public health.

Information System and Technology in Veterinary Public Health

Computer-based information system management and technology, data structure, system analysis design, database and network management system, veterinary public health issues of information system and its application.

Molecular Technology in Animal Health and Biomedical Sciences

Theory and basic sciences related to biotechnology, basic techniques in DNA analysis, DNA

cloning, DNA sequencing, analysis of gene expression, genetic mutation, DNA and RNA bioinformatics, protein bioinformatics, analysis of protein-protein interactions and of protein-nucleic acid interactions, genetic engineering and its applications, applications of interference RNA in animal health and biomedical science research.

Biotechnology in Animal Health and Biomedical Sciences

Theory and basic sciences related to biotechnology, basic techniques in DNA analysis, DNA cloning, DNA sequencing, analysis of gene expression, genetic mutation, DNA and RNA bioinformatics, protein bioinformatics, analysis of protein-protein interactions and of protein-nucleic acid interactions, genetic engineering and its applications, applications of interference RNA in animal health and biomedical science research.

Research Methodology in Animal Health and Biomedical Sciences

Research proposal writing, concept of research, research methodology, types of research and research instruments, research design, principles of animal health and biomedical sciences ethics, code of practice for the care and use of animals, health and disease of laboratory animals, data collection, data analysis and interpretation, research reporting, research presentation and evaluation of research articles.

Selected Topics in Animal Health and Biomedical Sciences

Selected topics in animal health and biomedical sciences in master's degree level. Topics are subjected to change each semester.

Seminar

Presentation and discussion on current interesting topics in animal health and biomedical sciences in master's degree level.

Special Problems

Study and research in animal health and biomedical sciences at the master's degree level and compile into a written report.