

**Course description**  
**Doctor of Veterinary Medicine Program**  
**(Revised Curriculum 2015)**

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**Faculty of Economics**

751100 ECON 100      ECONOMICS FOR EVERYDAY LIFE      3(3-0-6)

Prerequisite : None

Basic economic concepts and application for everyday life concerning production, consumption, markets, national income, public finance, money and banking, inflation and deflation, employment, international trade and finance, and economic development and environment.

**Faculty of Humanities**

001101 ENGL 101      FUNDAMENTAL ENGLISH 1      3(3-0-6)

Prerequisite : None

Communication in English for everyday interactions. Basic listening, speaking, reading and writing skills in various social and cultural contexts for life-long learning.

001102 ENGL 102      FUNDAMENTAL ENGLISH 2      3(3-0-6)

Prerequisite : ENGL 101 or consent of the department

Communication in English for everyday interactions. More advanced listening, speaking, reading and writing skills in various social and cultural contexts for life-long learning.

001201 ENGL 201      CRITICAL READING AND EFFECTIVE WRITING      3(3-0-6)

Prerequisite : None

English language skills for critical reading from different sources and media and effective writing on topics of students' interests.

001226 ENGL 226      ENGLISH IN HEALTH SCIENCES CONTEXT      3(3-0-6)

Prerequisite : None

Specific language functions, components and skills for effective communication in health science contexts.

011257 PHIL 257 ETHICS 3(3-0-6)

Prerequisite : None

Ethical concepts. Development of ethical theories. Ethical theories and problems. Moral problems in contemporary society.

011269 PHIL 269 PHILOSOPHY OF SUFFICIENCY ECONOMY 3(3-0-6)

Prerequisite : None

Definition, concept and principle of philosophy of sufficiency economy. Livelihood according to philosophy of sufficiency economy. Application of the principle philosophy of sufficiency economy.

013110 PSY 110 PSYCHOLOGY AND DAILY LIFE 3(3-0-6)

Prerequisite : None ; for non-major only

Psychology and daily life. Individual factors. Interpersonal factors. Social factors.

050100 HUGE 100 USAGE OF THE THAI LANGUAGE 3(3-0-6)

Prerequisite : None

A study of the usage of the Thai Language and practice in writing.

050111 HUGE 111 MAN AND QUEST FOR KNOWLEDGE 3(3-0-6)

Prerequisite : None

Development of thoughts and methods of thinking, which result in knowledge acquisition. Ultimate goals of individuals and societies. Inheritance, interconnection and integration of knowledge. Debates in theoretical approaches to knowledge. Modes of explanation on present social phenomena.

### **Faculty of Education**

074101 EDHL 101 PROMOTING OF HEALTH IN EVERYDAY LIFE 3(2-3-0)

Prerequisite : None

Health and important of promoting of health. Promoting of personal and community health. An evaluate of personal and community health status.

## Faculty of Fine Arts

109115 FAGE 115 LIFE AND AESTHETICS 3(3-0-6)

Prerequisite : None

Beauty in general found in nature, works of art, traditions and culture and modern media used in daily life. Aesthetics in western and eastern art. Traditions and culture, beliefs and cultural creations that reflect social wisdom.

## Faculty of Business Administration

702101 FINA 101 FINANCE FOR DAILY LIFE 3(3-0-6)

Prerequisite : None

Exploring your financial health, Planning your personal financial plan, Revenue, expense, and debt service management, Insurance, Knowing how to make money work, Tax planning, Preparing for happiness and case study of financial planning.

703103 MGMT 103 INTRODUCCION TO ENTREPRENEURSHIP AND BUSINESS 3(3-0-6)

Prerequisite : None

Entrepreneur role in economics development country Entrepreneur and business opportunities. The characteristic of entrepreneur and motivation factors, environment, types of business, forms of business, business plans, principle of management, marketing management, production management, financial management, accounting, taxation, business law, international business and business ethics for entrepreneur.

703131 MGMT 131 PERSONAL LEADERSHIP DEVELOPMENT 1(1-0-2)

Prerequisite : None

Foundations of personal development. Responding to stimulus. Personal vision. Personal management. Mutual benefit. Mutual understanding. Constructive cooperation. Self renewal.

## Faculty of Law

176100 LAGE 100 LAW AND MODERN WORLD 3(3-0-6)

Prerequisite : None

Legal concepts. Legal Institutions. Law and its roles in society. Law and international societies. Law and local problems. Law and community rights. Roles of law in the rural and urban societies. Roles of law in the globalized era. Analyses of issues derived from case studies relating to law and modern world.

## Faculty of Science

201111 SC 111 THE WORLD OF SCIENCE 3(3-0-6)

Prerequisite : None

The nature and evolution of science and technology. The solar system, modern observations of planets and moons. The interrelations of Earth's geosphere, hydrosphere, atmosphere and biosphere. Abundance, distribution and utilization of natural resources. Contemporary social issues in science and society. Enrollments are not permitted for non- science-based students.

201114 SC 114 ENVIRONMENTAL SCIENCE IN TODAY'S WORLD 3(3-0-6)

Prerequisite : None

Environment and impacts from anthropogenic activities, Environmental concerns in international venues, Importance of biodiversity; conservation for the future, Resource use, Population growth and pollution, Ozone depletion, Global warming and climate change, Energy crisis, Sustainable development (balancing of natural resource consumption and replacement), and Current environmental issues.

204100 CS 100 INFORMATION TECHNOLOGY AND MODERN LIFE 3(2-2-5)

Prerequisite : None

Computers in everyday life, Data processing and information management, Office automation software for modern life and Internet and webpage construction.

203154 CHEM 154 BASIC CHEMISTRY FOR HEALTH SCIENCE STUDENTS 2(2-0-4)

Prerequisite : None

Chemical thermodynamics, chemical equilibrium, chemical kinetics, aliphatic hydrocarbons, aromatic compounds, stereochemistry, nucleophilic substitution, free radicals, alcohols ethers and phenols, aldehydes and ketones, carboxylic acids and their derivatives, amines, carbohydrates, amino acids, peptides and proteins, lipids, heterocycles and nucleic acids.

203159 CHEM 159 BASIC CHEMISTRY LABORATORY FOR HEALTH SCIENCE STUDENTS 1(0-3-0)

Prerequisite : concurrent to 203153 OR 203154

The basic chemical experiments related to the following topics: Heats of chemical reactions, electrochemical cells, acid-base indicators and hydrolysis of salts, buffer solutions: preparation and properties, rate of chemical reactions, steam distillation, identification of hydrocarbons, alcohols, phenols, aldehydes and ketones, stereochemistry, saponification of lipid, TLC separation of amino acids, isolation and identification of casein, isolation of lipids from egg yolk, isolation and identification of DNA from yeast.

207110 PHYS 110      PHYSICS : THE SCIENCE THAT CHANGED THE WORLD      3(3-0-6)

Prerequisite : None

Paradigms and their revolutions, Ptolemy, Copernicus, and Kepler cosmos, Mechanistic perspective, Energy and thermodynamics, Electromagnetism, Atoms and matters, Quantum theory and holistic perspective, Space, time and theory of relativity and Frontier physics.

207125 PHYS 125      PHYSICS FOR VETERINARY STUDENTS      1(1-0-2)

Prerequisite : None

Physics in health sciences, stability and equilibrium of body motion, elasticity, impulsive force and bone fractures, fluids mechanics and its medical applications, waves and properties of waves, sound and ultrasound imaging, electromagnetic spectrum and medical X-rays.

207195 PHYS 195      PHYSICS LABORATORY FOR VETERINARY STUDENTS      1(0-3-0)

Prerequisite : None

A laboratory course dealing with basic experimental techniques and applications in physics for veterinary students, consisting of various experiments in mechanics, thermal physics, mechanical waves, electricity, optics and modern physics in accordance with course content in PHYS 185.

### **Faculty of Medicine**

303210 BCHM 210      GENERAL BIOCHEMISTRY      3(2-2-5)

Prerequisite : None

Cells and cellular components, structure and functions of biomolecules namely nucleic acid, protein, carbohydrate and lipid, enzyme and cofactors, membrane transport and signal transduction, gene and human genome, DNA replication, gene expression and regulation, genetic engineering and DNA technology, bioenergetics and cellular energy production, digestion of biomolecules, absorption and metabolism of carbohydrates, lipids, amino acids and proteins, and nucleotide, interrelationships of metabolic pathways and regulation.

303262 BCHM 262      VETERINARY CLINICAL BIOCHEMISTRY      2(2-0-4)

Prerequisite : BCHM 210 (303210)

Biochemistry of cancer in human and animal, biochemistry of diseases related to; structural abnormality of biomolecules, metabolic disorders of carbohydrate, protein, lipid and nucleic acid, biochemistry knowledge-based analysis of animal diseases

324321 RADI 321 RADIOLOGY FOR VETERINARY STUDENTS 2(1-3-2)

Prerequisite : third year standing

Basic knowledge and skill in radiographic imaging in assisting the diagnosis of abnormality in animals and application of radiological instruments for routine examinations and research.

### Faculty of Nursing

571111 NGGE 111 CRITICAL THINKING AND CREATIVE THINKING 3(2-2-5)

Prerequisite : None

Fundamental principles of thinking, forms of thinking, definitions of critical thinking and creative thinking. Principles and components of critical thinking and creative thinking. Advantages of critical thinking and creative thinking. Factors related to critical thinking and creative thinking. Development and enhancement of critical thinking and creative thinking and use of critical thinking and creative thinking in daily life.

571113 NGGE 113 MAINTAINING THE EQUILIBRIUM IN ADOLESCENT LIFE 3(3-0-6)

Prerequisite : None

Study of factors influencing adolescents' way of life, including both positive and negative factors. Ways of maintaining the equilibrium in adolescents' way of life. Prevention and management of physical, psychosocial, emotional and spiritual problems in adolescent's lives.

### Faculty of Associated Medical Sciences

510100 AMS 100 WELLNESS 3(2-3-4)

Prerequisite : None

Involving the wellness and health status in physical, emotional, social, intellectual and spiritual wellness including principle of good health in holistic both knowledge and merit, following by diet, nutrition, exercise, fitness, wellness and health status laboratory monitoring, stress management and ethic.

### Faculty of Agriculture

351100 AEC 100 AGRICULTURAL ECONOMICS BASED ON SUFFICIENCY ECONOMY 3(3-0-6)

Prerequisite : None

Study on His Majesty the King's sufficiency economy philosophy and the royal obligations as a foundation and representations of what applicable for leading one's daily life at the individual, household, and community levels. Stress on students' the learning from experience of various rural and agricultural communities which have applied the sufficiency economy principle, exercising systematic analytical thinkings, and proposing agricultural business model within sufficiency economy framework.

359204 HORT 204 HORTICULTURAL FOR HEALTH 2(2-0-4)

Prerequisite : None

Importance, categories, production, and health benefits from horticultural crops which are vegetables, medicinal plants, fruits, and flowers, including their use as horticultural therapy.

362211 CONS 211 PRINCIPLES OF CONSERVATION 3(3-0-6)

Prerequisite : None

Problems concerning deterioration of natural resources and environments. Principles and methods of management and conservation of natural resources.

356202 ANS 202 PRINCIPLES OF FEED AND ANIMAL NUTRITION 3(3-0-6)

Prerequisite : None ; for non – major students

Types and roles of feedstuffs, composition and evaluation of feed, digestion and metabolism of nutrients, feed preservation and processing and nutrient requirements of animals.

356212 ANS 212 ANIMAL PRODUCTION 3(3-0-6)

Prerequisite : None ; for non-agriculture students

A simplified version of ANS 201 for student in art, social sciences, education or those having a weaker scientific background. More detail in the economic importance, trade, nutrition and social role of livestock.

356261 ANS 261 STATISTICAL METHOD AND INFERENCE IN ANIMAL HUSBANDRY 3(3-0-6)

Prerequisite : second year standing

Statistic with special reference to the application in animal science, from probability, normal distribution, test of significance to factorial and splitplot design. Correlation and regression. Analysis of covariance. The computation of heritability and repeatability.

### **Faculty of Veterinary Medicine**

651100 VM 100 DOG CARE 2(1-2-3)

Prerequisite : None

General considerations for dog's owner, principle of dog care, behavior, restraint, reproductive system, pregnancy including basic health information.

651101	VM 101	CAT CARE	2(1-2-3)
		Prerequisite : None	
		General considerations for cat's owner, principle of cat care, behavior, restraint, reproductive system, pregnancy including basic health information	
651102	VM 102	HORSE AND MANAGEMENT	2(1-2-3)
		Prerequisite : None	
		Fundamental studies of breeds of horse, motions of horse, horse and a way of Thai life, horse in the present day and a benefit for medicine, basic principles of horse stable management and horse feeding, basic principles of horse health care, and basic principles of horse restraint, horse riding and riding tacks.	
651104	VM 104	ELEPHANT IN THAI CULTURES	2(2-0-4)
		Prerequisite : None	
		Study of Thai elephant cultures and knowledge, as the elephant biology, elephant in Thai cultures, customs, legends faiths, religions, and histories, the knowledge of the illustrated manuscript (the book on elephant science) , elephant poaching, elephant training, logging, and to domesticate elephant, mahout and elephant keeper, elephant managements, elephants in Thailand.	
651105	VM 105	ECOSYSTEM AND HEALTH	3(3-0-6)
		Prerequisite : None	
		The relations between ecosystem and health and effects on human and animal life. Integration of knowledge of science for explaining the changes of plants, animals and environment, especially the changes that affect to human life effects.	
651106	VM 106	Food Sanitary from Food Animal for Consumer	2(1-2-3)
		Prerequisite : None	
		Criteria for selection raw materials and food from animal, Sanitary in production line from farm to table. Criteria selection raw materials and food from animal, Sanitary in production line from farm to table.	



651107 VM 107 LEARNING THROUGH ACTIVITIES 2(1-3-0)

Prerequisite : None

This course is designed to introduce students in developing their life-skill experiences through activities which are initiated by themselves. Learning activities are emphasized on the development of student's personalities, morality and ethical behaviors. Attention is given to various learning activities including recognizing art and culture, understanding of local wisdom, preserving of environment as well as exploring the role of community-based economy. Various activities are organized by students under the supervision agreement of class advisors with private/governmental organizations.

651109 VM 109 VETERINARY EMBRYOLOGY 2(2-0-4)

Prerequisite : None ; for veterinary medicine students

Gametogenesis. Fertilization. Preimplantation embryo development. Fetal development and systemic development in domestic animals. Comparative differences of placenta in mammals. Clinical congenital anomaly of fetus. Basic knowledge of embryo biotechnology in veterinary medicine.

651120 VM 120 PRINCIPLES OF VETERINARY GENETICS 2(2-0-4)

Prerequisite : None ; for veterinary medicine students

Introduction to veterinary genetics. Gene expression. Mutation. Breed and breeding. Chromosome and genetic abnormalities.

651210 VM 210 PRINCIPLES OF VETERINARY BIOSCIENCES 4(3-3-7)

Prerequisite : None ; for veterinary medicine students

Cell biology. Animal taxonomy, Introduction to veterinary anatomy. Introduction to veterinary histology. Body structure and function of teleost. Body structure and function of amphibians and reptiles. Body structure and function of birds. Body structure and function of small mammals. Integration of comparative anatomy in vertebrates.

651211 VM 211 BODY STRUCTURE AND FUNCTION 1 4(3-3-7)

Prerequisite : VM 109 (651109)

Gross anatomy of integumentary system. Histology of integumentary system. Physiology of integumentary system. Gross anatomy of brain and spinal cord. Gross anatomy of peripheral nerves. Histology of nervous system. Physiology of neuron. Physiology of central nervous system. Physiology of motor system and reflexes. Physiology of sensory system. Gross anatomy of special sense organs. Histology of special sense organs. Physiology of special sense organs.

651212 VM 212 BODY STRUCTURE AND FUNCTION 2 4(3-3-7)

Prerequisite : VM 109 (651109)

Gross anatomy of bone and joint system. Histology of bone and joint system. Physiology of bone and joint system. Gross anatomy of muscular system. Histology of muscular system. Physiology of muscular system. Gross anatomy of gastrointestinal system. Histology of gastrointestinal system. Physiology of gastrointestinal system.

651231 VM 231 PRINCIPLE OF AQUATIC ANIMAL PRODUCTION 2(2-0-4)

Prerequisite : None ; for veterinary medicine students.

Lecture on principle of aquatic animal biology, principle of aquaculture, genetic in fisheries, nutrition of aquatic animal, breeding management, soil and water management and algae in aquaculture. A variety of important aquaculture species for instance fish, invertebrate, reptiles and amphibians. It also covers aquaculture economy.

651232 VM 232 BASIC HORSE RIDING AND HORSE CARE 2(1-3-3)

Prerequisite : second year standing; for veterinary medicine students.

Basic principles of horse restraint, horse stable management, horse feeding and nutrition, horse care and basic principle of horse riding.

651234 VM 234 ANIMAL BEHAVIORS, RESTRAINTS AND WELFARE 3(2-2-5)

Prerequisite : second year standing; for veterinary medicine students.

Principles of animal behaviors. Principles of animal restraints. Factors influencing animal behaviors. Animal abnormal behaviors. Animal behavior study. Behaviors and restraints of various kinds of animals : dog and cat, ruminant, horse, elephant, zoo and wild animals, birds and exotic pets, poultry, pig and aquatic animals. Animal behaviors enrichment. Animal welfare.

651293 VM 293 VETERINARY INTEGRATIVE PROBLEM SOLVING 1 2(2-0-4)

Prerequisite : second year standing; for veterinary medicine students.

Use of problem-based learning system to integrate veterinary fundamental content through seminar. Practice on problem analysis and integration of subject material. Information searching. Veterinary terminology and scientific literature review.

651311 VM 311 BODY STRUCTURE AND FUNCTION 3 4(3-3-7)

Prerequisite : VM 109 (651109)

Gross anatomy of respiratory system. Histology of respiratory system. Physiology of respiratory system. Gross anatomy of cardiovascular system. Histology of cardiovascular system. Physiology of cardiovascular system. Gross anatomy of hemo-lymphatic system. Histology of hemo-lymphatic system. Body fluid. Blood corpuscle and plasma.

- 651312 VM 312 BODY STRUCTURE AND FUNCTION 4 4(3-3-7)  
Prerequisite e : VM 109 (651109)  
Gross anatomy and histology of endocrine system. Physiology of endocrine system. Gross anatomy of reproductive system, Histology of reproductive system. Physiology of male reproductive system. Physiology of female reproductive system. Gross anatomy of urinary system. Histology of urinary system. Physiology of urinary system.
- 651313 VM 313 VETERINARY GENERAL PATHOLOGY 3(2-3-5)  
Prerequisite : third year standing; for veterinary medicine students  
Basic mechanisms involved in cellular and tissue injuries. Degenerative changes in cells, cell death, pigmentation, circulatory disturbances, inflammatory process, tissue healing and neoplasia in animals.
- 651314 VM 314 VETERINARY IMMUNOLOGY 3(2-3-5)  
Prerequisite : third year standing; for veterinary medicine students.  
Functional aspects of humoral and cellular immunity of mammalian, avian and aquatic animals. Mechanisms of immunity to microbial infection. Tumor immunity. Immune-mediated diseases. Failures of host defense mechanisms, allergy, hypersensitivity and organ transplantation. Vaccines, related biological products and vaccination. Immunological methods and applications of molecular biology and biotechnology in clinical diagnosis.
- 651315 VM 315 VETERINARY MICROBIOLOGY 5(4-3-9)  
Prerequisite : third year standing; for veterinary medicine students.  
Morphology, culturing, classification, pathogenesis and identification of veterinary important microorganisms comprising bacteria, fungi, viruses and prions.
- 651316 VM 316 VETERINARY PARASITOLOGY 5(4-3-9)  
Prerequisite : third year standing; for veterinary medicine students.  
Basic knowledge including morphology, life cycle, pathogenesis, identification and diagnosis of agents of diseases in domestic animals comprising helminthes, insects, protozoa and rickettsia.
- 651317 VM 317 VETERINARY PHAMACOLOGY 1 3(3-0-6)  
Prerequisite e : third year standing; for veterinary medicine students.  
Principles of pharmacokinetics and pharmacodynamics. Drug interaction. Veterinary pharmacology of systemic drugs including nervous, gastrointestinal, circulation and urinary, blood and immune, reproductive and endocrine, respiratory and musculoskeletal systems.

651318	VM 318	VETERINARY TOXICOLOGY	2(2-0-4)
Prerequisite : third year standing; for veterinary medicine students.			
Basic principles of veterinary toxicology. Therapy of toxicoses in animals. Toxicology of zootoxins, plant-related toxins, mycotoxins, heavy metals, pesticides and miscellaneous toxic substances.			
651390	VM 390	VETERINARY FIELD PRATICE 1	1(0-6-3)
Prerequisite : third year standing; for veterinary medicine students.			
Field practice on animal husbandry and livestock management through working in related private or government organizations.			
651393	VM 393	VETERINARY INTEGRATIVE PROBLEM SOLVING 2	2(2-0-4)
Prerequisite : third year standing; for veterinary medicine students.			
Seminar using problem-based learning to integrate veterinary content in fundamental level.			
651394	VM 394	VETERINARY INTEGRATIVE PROBLEM SOLVING 3	2(2-0-4)
Prerequisite : third year standing; for veterinary medicine students.			
Seminar using problem-based learning to integrate veterinary content in fundamental level and clinical level.			
651416	VM 416	FOOD SAFETY IN VETERINARY MEDICINE 1	4(3-3-7)
Prerequisite : third year standing; for veterinary medicine students.			
Roles of veterinarian in food protection of food from animal origin. Methods of sampling and quality control. Roles of microorganisms in food from animal origin. Foodborne diseases throughout food chain. Composition and testing in food. Deterioration and preservation in food from animal origin. Raw materials and food additives in using animal-originated food production. Contaminant and impurity in food from animal origin. Technology in animal-originated food production.			
651417	VM 417	FOOD SAFETY IN VETERINARY MEDICINE 2	4(3-3-7)
Prerequisite : fourth year standing; for veterinary medicine students			
Hygienic production and processing control of food from animal origin. Principles of quality control in meat, milk, eggs and aquatic animals. Food hygiene. Personal hygiene. Cleaning and use of disinfectant. Cross- contamination management. Food processing standard for consumption and export along the production chain.			
651418	VM 418	VETERINARY ENVIRONMENTAL HEALTH	1(1-0-2)
Prerequisite : fourth year standing; for veterinary medicine students			
Environmental hygiene. Environmental toxicology. Environmental management and waste management from farm and animal product processing. Environmental management and sustainable development. Risk analysis and risk assessment. Audit system for environmental health impact.			

651419	VM 419	VETERINARY LAWS	1(1-0-2)
		Prerequisite : fourth year standing; for veterinary medicine students	
		Introduction to law. Veterinary laws and legislative practice. Laws and regulations concerning public health and environment. Rules and regulations mandated by international organizations. Veterinary ethics.	
651424	VM 424	ZOONOSES	2(2-0-4)
		Prerequisite : fourth year standing; for veterinary medicine students	
		Zoonoses classification, causative agents, transmission, vector, clinical symptoms in both human and animals, prevention, diagnosis and treatment of important zoonoses caused by virus, bacteria, parasite, chlamydia and fungus.	
651425	VM 425	VETERINARY EPIDEMIOLOGY	3(2-2-5)
		Prerequisite : third year standing; for veterinary medicine students.	
		Scope and significance of epidemiology. Disease occurrence and dissemination in population. Epidemiological parameters. Association and causation of diseases. Epidemiological studies. Diagnostic test evaluation. Disease screening. Outbreak investigation. Disease surveillance. Disease prevention, control and eradication. Molecular epidemiology. Sample size and sampling methods.	
651430	VM 430	PRINCIPLES OF THERIOGENOLOGY	2 (2-0-4)
		Prerequisite : fourth year standing; for veterinary medicine students	
		Breeding soundness in male and female breeder animals. Reproductive failure in animals. Abnormality of pregnancy, parturition and postpartum in animals. Assisted reproductive technology such as artificial insemination and embryo transfer, estrus synchronization and ovulation induction, pregnancy diagnosis, parturition management, cryopreservation of gametes and embryos.	
651433	VM 433	LABORATORY ANIMAL SCIENCE	3(2-2-5)
		Prerequisite : fourth year standing; for veterinary medicine students	
		General consideration in laboratory animal care, species and breed, biology and husbandry, housing and management, production system , prevention and control of disease, materials for laboratory animal care and technique for restraint, veterinary clinical procedure of laboratory animals, and ethics in usage of laboratory animals.	
651434	VM 434	VETERINARY SYSTEMIC PATHOLOGY	5(3-6-9)
		Prerequisite : fourth year standing; for veterinary medicine students	
		Reactions of specific organ systems to infection including hemopoietic and lymphatic systems, endocrine system, male and female reproductive systems, respiratory system, gastrointestinal system, nervous and sensory systems, integument system, musculoskeletal and joint systems, cardiovascular system and urinary system.	

- 651435 VM 435 VETERINARY CLINICAL PATHOLOGY 4(3-3-7)
- Prerequisite : fourth year standing; for veterinary medicine students
- Pathological changes detection in body functions using laboratory interpretation including hematology, blood coagulation abnormality, bone marrow examination, blood chemistry, cytology, blood gas and electrolytes. Practice on necropsy.
- 651436 VM 436 PRINCIPLES OF VETERINARY MEDICINE 2(1-2-3)
- Prerequisite : fourth year standing; for veterinary medicine students
- Principles of history taking. Basic physical examination in animals. Principles of veterinary diagnosis using problem-oriented approach. Problems and clinical signs. Preparation and drug administration in veterinary medicine. Client communication.
- 651437 VM 437 PRINCIPLES OF VETERINARY SURGERY AND ANESTHESIOLOGY 3(2-3-5)
- Prerequisite : fourth year standing; for veterinary medicine students
- Principles of veterinary surgery. Aseptic technique. Wound healing and wound management. Surgical instruments and suture materials. Ligation and surgical suture techniques. Pre- and postoperative management of surgical patient. Casting and external support devices. Principles of veterinary anesthesiology and monitoring in animals.
- 651438 VM 438 PRACTICE OF SURGERY AND OBSTETRICS IN LIVESTOCK 1(0-3-1)
- Prerequisite : fourth year standing; for veterinary medicine students
- Practice of using sedative agents for both local and general anesthesia in ruminants, pigs and fish. Basic surgical operation in ruminants, pigs and fish. Reproductive management and obstetrics in ruminants, pigs, fish and poultry.
- 651439 VM 439 DISEASES OF SMALL ANIMALS 1 3(3-0-6)
- Prerequisite : fourth year standing; for veterinary medicine students
- Principles of history taking. Physical examination. Clinical problems and signs. Sample collection techniques. Etiology, pathogenesis, diagnosis, treatments, prevention and prognosis of diseases and disorders of cardiovascular system, respiratory system, integumentary system and ears, eyes, musculoskeletal system and nervous system in dogs and cats.
- 651440 VM 440 DIAGNOSTIC TECHNIQUES AND IMAGING IN SMALL ANIMALS 2(1-2-3)
- Prerequisite : fourth year standing; for veterinary medicine students
- Interpretation of diagnostic images, physical examination techniques, diagnosis and sample collection in small animals.

651442 VM 442 VETERINARY PHARMACOLOGY 2 2(2-0-4)

Prerequisite : VM 317(651317)

Antibacterial drugs and resistance of antimicrobials. Antiseptic and disinfectants. Antifungal drugs. Antiparasitic drugs. Analgesic and anti-inflammatory drugs. Antineoplastic drugs. Veterinary herbs. Vitamins and feed additives. Fluid and electrolytes.

651444 VM 444 DISEASES OF HORSES 3(3-0-6)

Prerequisite : fourth year standing; for veterinary medicine students

Diseases and disorders leading to poor equine athletic performance. Diseases and disorders leading to poor equine productivity and conditions. Diseases and disorders leading to life threatening conditions in horses. Diseases and disorders leading to non-life threatening conditions in horses. Equine contagious diseases. Control and prevention of diseases. Roles of veterinarians for epidemic diseases control.

651491 VM 491 VETERINARY FIELD PRACTICE 2 1(0-6-3)

Prerequisite : fourth year standing; for veterinary medicine students

Field practice on veterinary paraclinic or veterinary public health, aquatic animals, horses, domestic animals or wildlife animals management through working in private or government organizations.

651521 VM 521 WILD AND EXOTIC ANIMALS MEDICINE 3(3-0-6)

Prerequisite : fifth year standing; for veterinary medicine students

Basic biology and taxonomy of wild animals. Restraint and translocation of zoo and wild animals. Zoo management and animal behaviors enrichment. Breeding system in zoo and exotic animals. Preventive medicine in zoo and wild animals. Law, regulation and ethics in zoo and wild animals. Zoo and wild animals zoonoses. Common diseases in zoo and exotic animals. Anesthesia and surgery in exotic animals. Wild animals conservation.

651522 VM 522 DISEASES OF SMALL ANIMALS 2 2(2-0-4)

Prerequisite : fifth year standing; for veterinary medicine students

Principles of history taking. Physical examination. Clinical problems and signs. Sample collection techniques. Etiology, pathogenesis, diagnosis, treatments, prevention and prognosis of diseases and disorders of digestive system, hepatobiliary and exocrine pancreatic system, urinary system, reproductive system. Fluid therapy. Pediatric and geriatric care.

651523 VM 523 DISEASES OF SMALL ANIMALS 3 2 (2-0-4)

Prerequisite : fifth year standing; for veterinary medicine students

Principles of history taking. Physical examination. Clinical problems and signs. Sample collection techniques. Etiology, pathogenesis, diagnosis, treatments, prevention and prognosis of diseases and disorders of endocrine system and hemo-lymphatic system. Benign and malignant tumors. Infectious diseases in small animals and prevention. Critical care and emergency treatment.

- 651524 VM 524 SMALL ANIMAL SURGERY AND ANESTHESIOLOGY 3(2-3-5)  
 Prerequisite : fifth year standing; for veterinary medicine students  
 Soft tissue surgery, orthopedic surgery, anesthesia and monitoring in small animals.
- 651525 VM 525 DISEASES OF AQUATIC ANIMALS 3(3-0-6)  
 Prerequisite : fifth year standing; for veterinary medicine students  
 Diagnostic and therapeutic techniques in aquatic animals. Drugs and chemical used in aquatic animals. Common diseases in aquatic animals, amphibians and reptiles. Health care and standard aquatic animal farm management. Aquatic animals welfare.
- 651526 VM 526 DISEASES OF POULTRY 3(3-0-6)  
 Prerequisite : fifth year standing; for veterinary medicine students  
 Important infectious diseases, defense mechanisms, disease diagnosis, disease control and prevention in poultry.
- 651527 VM 527 DISEASES OF SWINE 3(3-0-6)  
 Prerequisite : fifth year standing; for veterinary medicine students  
 Common infectious diseases in pigs, etiology, clinical signs, epidemiology, pathogenesis, diagnosis, treatment and prevention.
- 651529 VM 529 DISEASES OF RUMINANTS 4(4-0-8)  
 Prerequisite : fifth year standing; for veterinary medicine students  
 History taking and physical examination. Causes of diseases, pathogenesis, clinical signs, diagnosis and treatments of diseases in ruminants affecting circulatory and hematopoietic systems, respiratory system, gastro-intestinal system, reproductive system and congenital abnormalities, nervous system, integuments and musculoskeletal systems. Metabolic diseases. Mastitis in ruminants. Disease control and prevention in ruminants. Epidemic diseases reporting.
- 651551 VM 551 FLOCK HEALTH MANAGEMENT AND PRODUCTION MEDICINE 2(2-0-4)  
 IN POULTRY  
 Prerequisite : fifth year standing; for veterinary medicine students  
 Poultry flock health management. Poultry house environment management and health problems. Production performance evaluation and poultry welfare.



- 651552 VM 552 HERD HEALTH MANAGEMENT AND PRODUCTION MEDICINE IN SWINE 3(3-0-6)
- Prerequisite : fifth year standing; for veterinary medicine students
- Swine herd health management. Breeder's reproduction and health management. Production system and farm standard. Production index analysis. Management and problems in breeding and gestation unit ; farrowing unit ; fattening unit. Nutrition and malnutrition. Toxin problems and management. Biosecurity system, medication and vaccination programs. Economics in swine production.
- 651553 VM 553 HERD HEALTH MANAGEMENT AND PRODUCTION MEDICINE IN RUMINANTS 2(2-0-4)
- Prerequisite : fifth year standing; for veterinary medicine students
- Production cycle and dairy farm management. Dairy farm standard. Nutritional management. Important index for productivity. Herd health and production management data storage. Cattle data storage. Data recording for milk quality. Udder health. Milking machine system. Infertility and reproductive management in cattle.
- 651561 VM 561 SMALL ANIMAL CLINICAL SKILL PRACTICE 3(0-9-4)
- Prerequisite : fifth year standing; for veterinary medicine students
- Clinical skills in small animals including medicine, surgery, clinical pathology and necropsy.
- 651562 VM 562 VETERINARY PUBLIC HEALTH SKILL PRACTICE 1(0-3-1)
- Prerequisite : fifth year standing; for veterinary medicine students
- Practice to increase laboratory skills in the field of veterinary public health under supervision of instructors.
- 651563 VM 563 ELEPHANT AND WILDLIFE CLINICAL SKILL PRACTICE 1(0-3-1)
- Prerequisite : fifth year standing; for veterinary medicine students
- Clinical skills practice in elephant and wildlife including elephant camp and zoo design and management, restraint of elephant and wildlife, diagnostic and therapeutic techniques of elephant and wildlife, treatment of elephant and wildlife common diseases, management of elephant and wildlife, and conservation of elephant and wildlife in Thailand.
- 651564 VM 564 EQUINE CLINICAL SKILL PRACTICE 1(0-3-1)
- Prerequisite : fifth year standing; for veterinary medicine students
- Clinical skills practice in equine including horse identification, physical examination, drug administration, intravenous catheterization, blood collection, lameness examination, perineural and intra-articular anesthesia, radiography and ultrasonography, bandaging techniques for extremity, hoof trimming and hoof abscess opening,

rectal palpation for reproductive system examination, oral examination and dental care, nasogastric intubation and gastric lavage and ophthalmic examination.

651565 VM 565 AVIAN CLINICAL SKILL PRACTICE 1(0-3-1)

Prerequisite : fifth year standing; for veterinary medicine students

Clinical skills practice in poultry including diseases prevention and control, medicine, clinical pathology and necropsy, farm management system and problems analysis solving.

651566 VM 566 SWINE CLINICAL SKILL PRACTICE 1(0-3-1)

Prerequisite : fifth year standing; for veterinary medicine students

Swine clinical skill practice in herd health and production data analysis. Practice in clinical pathology and necropsy of swine diseases. Management and problems solving in swine farms including production cost analysis in swine farms.

651567 VM 567 RUMINANT CLINICAL SKILL PRACTICE 1(0-3-1)

Prerequisite : fifth year standing; for veterinary medicine students

Practice on history taking and recording data for individual and herd-level of ruminants. Physical examination. Sample collection for diagnosis and interpretation. Explaining, giving recommendation and solving health problems of ruminants together with performing basic treatments. Recording and analyzing health and production data. Nutritional status assessment and providing advice for feeding and rearing ruminants

651568 VM 568 AQUATIC ANIMAL CLINICAL SKILL PRACTICE 1(0-3-1)

Prerequisite : fifth year standing; for veterinary medicine students

Clinical skills practice in aquatic animals including drugs and chemical used in aquatic animals, anesthesia and surgery in fish, physical examination, sample collection of live animals, blood sampling and hematological examination, necropsy and sampling collection for laboratory in fish and shrimp, water sampling and water quality analysis and production and management system in fish farms.

651620 VM 620 VETERINARY PERSPECTIVES 2(2-0-4)

Prerequisite : sixth year standing; for veterinary medicine students

Information about veterinary profession, either domestic or international receiving directly from experienced and successful persons in veterinary profession from several aspects. Creation of good attitude and construction of fondness toward veterinary profession. Grading will be given on satisfactory or unsatisfactory basis.

651630 VM 630 AQUATIC ANIMAL PRACTICE – CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Practice clinical skills in aquatic animal including production management, diagnostic and therapeutic techniques and studying on aquatic animal researches under supervision of instructors and adjoined veterinarians in animal health center, demonstration farm, commercial farm, animal hospital and other related facilities in government and private sectors.

651631 VM 631 ELEPHANT AND WILDLIFE PRACTICE – CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Practice clinical skills in elephant, wildlife and exotic pets including health management, necropsy, diagnostic and therapeutic techniques and studying on elephant ,wildlife and exotic pets researches under supervision of instructors and adjoined veterinarians in animal health center , farm, animal hospital and other related facilities in government and private sectors.

651640 VM 640 NECROPSY AND DIAGNOSTIC LABORATORY – CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Provide clinical experiences in necropsy and diagnostic laboratories practice through working veterinarian under supervision of instructors or adjoined veterinarians in Animal Health or demonstration farm, commercial farm, animal hospital or other related facilities.

651641 VM 641 ABATTOIRS AND VETERINARY PUBLIC HEALTH – CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Provide clinical experiences in abattoir and veterinary public health practice through working veterinarian under supervision of instructors or adjoined veterinarians in Animal Health or demonstration farm, animal hospital or other related facilities

651642 VM 642 DIAGNOSTIC IMAGING, ANESTHESIOLOGY AND SURGERY IN SMALL ANIMAL PRACTICE–CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Practice in the field of diagnostic imaging, anesthesiology, surgery and emergency and critical care of small animals as veterinarian under supervision of instructors and/or adjoined veterinarians in Small Animal Hospital.

651643 VM 643 CLINICAL CLERKSHIP IN DOGS AND CATS 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Practice in the field of internal medicine, surgery, diagnostic imaging, and anesthesia in dogs and cats as veterinarian under supervision of instructors and or adjoined veterinarians in Small Animal Hospital.

651644 VM 644 EQUINE PRACTICE – CLERKSHIP 3(0–9–4)

Prerequisite : sixth year standing; for veterinary medicine students

Providing clinical experiences in equine practice through working as a veterinarian under supervision of instructors or adjoined veterinarians in Animal Health Center, demonstration farms, commercial farms, animal hospitals or other related facilities.

651646 VM 646 SWINE PRACTICE – CLERKSHIP 3(0–9–4)

Prerequisite : sixth year standing; for veterinary medicine students

Providing clinical experience in swine practice through working as a veterinarian under supervision of instructors or adjunct instructors in the Animal Health Center, demonstration farm, commercial farm, animal hospital or other related facilities.

651647 VM 647 RUMINANT PRACTICE–CLERKSHIP 1 3(0–9–4)

Prerequisite : sixth year standing; for veterinary medicine students

Providing clinical experience in dairy practice through working as a veterinarian under supervision of instructors or adjunct instructors in the Animal Health Center, demonstration farm, commercial farm, animal hospital or other related facilities.

651649 VM 649 POULTRY PRACTICE–CLERKSHIP 3(0–9–4)

Prerequisite : sixth year standing; for veterinary medicine students

Clinical experience in avian practice under supervision of instructors or veterinarians in animal health center, farms, animal hospitals or other related organizations.

651650 VM 650 PROBLEMS IN NECROPSY AND DIAGNOSTIC LABORATORY –  
CLERKSHIP 3(0–9–4)

Prerequisite : sixth year standing; for veterinary medicine students

Advanced clinical experience in diagnostic laboratory and necropsy practice through working as a veterinarian and through investigation of interesting problems under supervision of instructors or adjoined veterinarians in the Animal Health Center, demonstration farm, commercial farm, animal hospital or other related facilities.

651651 VM 651 PROBLEMS IN ABATTOIRS AND VETERINARY PUBLIC HEALTH – CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Advanced clinical experience in veterinary public health practice through working as a veterinarian and through investigation of interesting problems under supervision of instructors or adjoined veterinarians in the Animal Health Center, demonstration farm, commercial farm, animal hospital or other related facilities.

651652 VM 652 PROBLEMS IN CANINE AND FELINE DIAGNOSTIC IMAGING AND ANESTHESIOLOGY–CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Advanced clinical experience in canine and feline diagnostic imaging and anesthesia practice through working as a veterinarian and through investigation of interesting problems under supervision of instructors or adjoined veterinarians from the Animal Health Center, Small Animal Teaching Hospital or other related facilities. Grading will be given on satisfactory or unsatisfactory basis.

651653 VM 653 PROBLEMS IN COMPANION ANIMAL PRACTICE – CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Practice of clinical experience in companion animal field under supervision of instructors or adjoined veterinarians in the animal health center, animal hospital or other related facilities

651654 VM 654 PROBLEMS IN EQUINE PRACTICE – CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Advanced clinical experience in equine practice through working as a through veterinarian and investigation of interesting problems under supervision of instructors or adjoined veterinarians in Animal Health Center, demonstration farm, commercial farm, animal hospital or other related facilities.

651656 VM 656 PROBLEMS IN SWINE PRACTICE – CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Advanced clinical experience in swine practice through working as a veterinarian and through investigation of interesting problems under supervision of instructors or adjoined veterinarians in the Animal Health Center, demonstration farm, commercial farm, animal hospital or other related facilities.

651657 VM 657 PROBLEMS IN RUMINANT PRACTICE – CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Advanced clinical experience in ruminant practice through working as a veterinarian and through investigation of interesting problems under supervision of instructors or adjoined veterinarians in the Animal Health Center, demonstration farm, commercial farm, animal hospital or other related facilities.

651658 VM 658 PROBLEMS IN AVIAN PRACTICE – CLERKSHIP 3(0-9-4)

Prerequisite e : sixth year standing; for veterinary medicine students

Advanced clinical experience in poultry practice through working as a veterinarian and through investigation of interesting problems under supervision of instructors or adjoined veterinarians in the Animal Health Center, demonstration farm, commercial farm, animal hospital or other related facilities.

651660 VM 660 PROBLEMS IN RUMINANT THERIOGENOLOGY–CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Practice for advanced clinical experience or studying interesting problems related to reproductive system in ruminant under supervision of instructors or adjoined veterinarians of Animal Health Service Center. Grading will be given on satisfactory or unsatisfactory basis.

651661 VM 661 PROBLEMS IN CANINE AND FELINE SURGERY–CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Advanced clinical experience in clinical practice in dogs and cats through working as a veterinarian and through investigation of interesting problems in surgery, anesthesiology and diagnostic imaging under supervision of instructors and/or adjoined veterinarians in small animal hospital. Grading will be given on satisfactory or unsatisfactory basis.

651663 VM 663 INTENSIVE CARE AND EMERGENCY UNIT – CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Advanced clinical experience in intensive care and emergency units through working as a veterinarian and through investigation of interesting problems under supervision of instructors or adjoined veterinarians in the Animal Health Center, demonstration farm, commercial farm, animal hospital or other related facilities.

651665 VM 665 PROBLEMS IN AQUATIC ANIMAL PRACTICE – CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Practice specific clinical skills in aquatic animal including production management and diagnostic and therapeutic techniques under supervision of instructors and adjoined veterinarians in animal health center, demonstration farm, commercial farm, animal hospital and other related facilities in government and private sectors.

651666 VM 666 PROBLEMS IN ELEPHANT AND WILDLIFE PRACTICE – CLERKSHIP 3(0-9-4)

Prerequisite : sixth year standing; for veterinary medicine students

Practice specific clinical skills in elephant, zoo animal, wildlife and exotic pet through working as veterinarian and investigation of interested problems under supervision of instructors and adjoined veterinarians in Animal Health Center, elephant hospital, elephant camp, zoo or other related facilities.

651670 VM 670 VETERINARY PROFESSIONAL EXPERIENCE 4(0-12-6)

Prerequisite : sixth year standing; for veterinary medicine students

Working in cooperative units either governmental or private units, such as animal farms, hospitals, clinics, companies, under the supervision of instructors, or veterinarians, or professional specialists from cooperative units that students enroll for work. Grading will be given on satisfactory or unsatisfactory basis.

651697 VM 697 RESEARCH IN VETERINARY MEDICINE 3(0-18-9)

Prerequisite : sixth year standing; for veterinary medicine students

Research methodology. Conducting a research project in veterinary medicine, under general guidance and supervision of instructors who have expertise on the students' selected projects. Grading will be given on satisfactory or unsatisfactory basis.