

NEW YORK STATE COLLEGE OF VETERINARY MEDICINE

ADMINISTRATION

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Douglas D. McGregor, associate dean for research and graduate education

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Gloria R. Crissey, director, office of student records, schedules, and financial planning

Corine Farewell, director of career development

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Jai Sweet, director of student services and multicultural affairs

DEPARTMENT CHAIRS

Biomedical Sciences: M. Kotlikoff

Clinical Sciences: R. Hackett, acting chair

Microbiology and Immunology: D. Russell

Molecular Medicine: G. Weiland

Population Medicine and Diagnostic Services: D. Lein

THE COLLEGE

The College of Veterinary Medicine offers a professional program that requires four years of full-time academic and clinical study of the normal and abnormal structure and function of the animal body and the diagnosis, treatment, and prevention of animal disease.

Graduates of the college receive the Doctor of Veterinary Medicine (D.V.M.) degree, which is recognized by licensing boards throughout the world. Graduates generally enter private practice, academia, or become engaged in one of the increasing number of other biomedical activities.

Admission requires a minimum of three years of college work, including specific prerequisite courses and experience. Applications must be filed approximately one year before the proposed matriculation date. The competition for admission is keen, since there are many more qualified applicants than can be admitted.

Graduate programs in veterinary research and postdoctoral training in clinical specialties are open to Doctors of Veterinary Medicine and some highly qualified holders of baccalaureate degrees and lead to the degree of Master of Science or Doctor of Philosophy.

More detailed information is contained in the catalog of the College of Veterinary Medicine, which may be obtained by writing to the college.

Note: 500- and 600-level courses are open only to veterinary students except by written permission from the instructor.

The College of Veterinary Medicine has revised its professional curriculum; the new course requirements apply to the class that matriculated in the fall of 1993 and to subsequent classes. Courses in the revised professional curriculum are designated with the prefix "VTMED" and consist of two categories of courses: foundation courses and distribution courses.

The Professional Curriculum

FOUNDATION COURSES

In foundation courses I, II, III, and IV (VTMED 510, 520, 530, 540), students work in small groups under the guidance of a faculty tutor. Case-based exercises are used to facilitate the understanding of basic science concepts within the context of clinical medicine. On average, three to four 2-hour tutorial sessions are scheduled each week. These are complemented by lectures, laboratories, and discussion sessions or other organized learning opportunities specific to the individual course. Faculty are available to respond to questions that arise as a result of the case-based exercises.

Tutorial sessions and all other organized learning programs are usually scheduled during the mornings, thereby reserving the afternoons for independent study. By situating learning in a clinical context, students are better able to integrate material from the basic and clinical sciences and are encouraged to develop an understanding of the clinical reasoning process from the beginning of the curriculum. The tutorial-based educational format creates an atmosphere that requires students to be involved actively in their learning and allows them to develop skills in communication, information retrieval, and analysis.

Note: Courses listed in brackets [] are approved courses that are not offered during the 2000–2001 academic year.

VTMED 510 The Animal Body (Foundation Course I)

Fall. 12 credits. Limited to first-year veterinary students. Letter grades only. J. W. Hermanson and staff.

This course is designed to enable students to understand the principles of veterinary anatomy at the gross, microscopic, and ultrastructural levels. Developmental anatomy is emphasized to the extent that it reflects determination of adult form and species differences. Radiologic and related imaging techniques are used throughout the course to assist in the understanding of normal structural anatomy. Understanding of the anatomic basis of common surgical procedures is achieved during the various dissection procedures. The course is based on tutorials with significant emphasis on practical laboratories. Lectures and modules complement student learning.

VTMED 517 Animals, Veterinarians, and Society: Part A (Foundation Course VIIa)

Fall. 1 credit. Limited to first-year veterinary students. Letter grades only. A fee of approximately \$10 is charged for the course guide. Staff.

This course is the correlate for VETMED 510 The Animal Body. This is a laboratory-based course that teaches physical examination of four species (dog, cat, cow, and horse). The class is divided into small groups and each group meets for two hours each week during the first 11 weeks. The skills of auscultation, percussion, palpation, and observation are taught along with clinically related diagnostic procedures.

VTMED 520 Genetics and Development (Foundation Course II)

Fall and spring. 8 credits. Limited to first-year veterinary students. Prerequisite: VETMED 510 The Animal Body. Letter grades only. R. A. Levine and staff.

An appreciation of how gene expression and cell behavior contribute to normal animal development and health is crucial for our understanding of the pathogenesis of disease. Students will gain an understanding of the cellular and molecular mechanisms that regulate development and maintain normal structure and function throughout the life of an animal. Emphasis will be placed on defining and characterizing normal cellular behaviors and on understanding how mutations in specific genes promote disease. Students will become familiar with the common molecular procedures being used to develop new diagnostic and therapeutic tools to maintain health and combat disease. Tutorial sessions are complemented by lectures, laboratories, and class discussions.

VTMED 521 Neuroanatomy and Clinical Neurology

Spring. 3 credits. Limited to first-year veterinary students. Letter grades only. A. deLahunta.

Fundamentals of functional neuroanatomy and diseases of the nervous system are taught so that each student is competent in the

diagnosis of clinical neurologic disorders of domestic animals. This is a vertically integrated course that includes dissection of the central nervous system of the dog, the anatomic basis for the diagnosis of diseases of the nervous system, and the differential diagnosis of those diseases. Clinical cases with pertinent lesions are demonstrated with each system. Films and videotapes of clinical patients are used to demonstrate the clinical signs produced by the various diseases. Slides of gross and microscopic lesions are used to emphasize the clinical and neuroanatomic relationships and to stress characteristic features of representative conditions.

VETMED 527 Animals, Veterinarians, and Society: Part B (Foundation Course VIIb)

This course begins in the last part of fall semester and finishes at the end of winter session. 1 credit. Limited to first-year veterinary students. Prerequisite: VETMED 517 Animals, Veterinarians, and Society: Part A. Letter grades only. A fee of approximately \$7 is charged for the course guide. Staff.

This course is the correlate for VETMED 520 Genetics and Development. It enters into a study of ethical issues related to animal use, animal welfare, animal genetics, clinical application of genetics, genetics counseling, and clinical day-to-day ethics. The course meets for one 2-hour session each week.

VETMED 530 Function and Dysfunction: Part I (Foundation Course IIIa)

Spring. 9 credits. Limited to first-year veterinary students. Prerequisite: VETMED 520 Genetics and Development. Letter grades only. D. Robertshaw and staff.

This course is designed to develop students' understanding of how an animal maintains itself as a functional organism; how this is achieved through the integration of different functional organ systems; how tissue structure relates to tissue function; how injury alters structure and leads to dysfunction, manifested as clinical signs; how organ function can be assessed; and how it can be modulated pharmacologically. The course incorporates aspects of physiology, biochemistry, cell biology, histology, pathology and histopathology, clinical pathology, and pharmacology.

VETMED 531 Function and Dysfunction: Part II (Foundation Course IIIb)

Fall. 7 credits. Limited to second-year veterinary students. Prerequisite: VETMED 530 Function and Dysfunction: Part I. Letter grades only. D. Robertshaw and staff.

A continuation of VETMED 530 Function and Dysfunction: Part I.

VETMED 537 Animals, Veterinarians, and Society: Part C1 (Foundation Course VIIc)

Spring. 1 credit. Limited to first-year veterinary students. Prerequisite: VETMED 527 Animals, Veterinarians, and Society: Part B. Letter grades only. A fee of approximately \$9 is charged for the course guide. Staff.

This course is the correlate for VETMED 530 Function and Dysfunction: Part I. The central goal of this course is to provide students with the interpersonal skills and techniques necessary to communicate effectively with clients. In addition, students will be provided an opportunity to study the human-animal bond, animal death, and grief counseling. This

course also provides opportunities to practice client interviewing skills and to participate in a home or farm visit.

VETMED 538 Animals, Veterinarians, and Society: Part C2 (Foundation Course VIIc, continued)

Fall. 1 credit. Limited to second-year veterinary students. Prerequisite: VETMED 537 Animals, Veterinarians, and Society: Part C1. Letter grades only. A fee of approximately \$6 is charged for the course guide. Staff.

This course is the correlate for VETMED 531 Function and Dysfunction: Part II. This course provides for understanding the importance of the medical record, the diversity of clients, employees, and society in general, and a session on alternative medicine and its various practices. How to critically read and evaluate clinical studies and journal articles is also addressed.

VETMED 540 Host, Agent, and Defense (Foundation Course IV)

Fall. 12 credits. Limited to second-year veterinary students. Prerequisite: VETMED 531 Function and Dysfunction: Part II. Letter grades only. J. Baines (course leader) and others.

This course is divided into six sections: the host response, intracellular environment, extracellular environment, somatic environment, external environment, and surrounding environment. Using this approach, students develop an understanding of the host response to insult, a familiarity with groups of important pathogens, an understanding of how pathogens manipulate the host and how the host defends itself against attacks, and an understanding of the roles played by the external environment and human intervention in the epidemiology of infectious organisms.

VETMED 547 Animals, Veterinarians, and Society: Part D (Foundation Course VIId)

Fall. 1 credit. Limited to second-year veterinary students. Prerequisite: VETMED 538 Animals, Veterinarians, and Society: Part C2. Letter grades only. A fee of approximately \$12 is charged for the course guide. Staff.

This course is the correlate for VETMED 540 Host, Agent, and Defense. The course will emphasize maintaining health in both individuals and populations of animals and humans. Topics will include animal bites, nosocomial infections, rabies control programs, vaccines and vaccine reactions, zoonotic diseases, and integrated health maintenance programs. The course emphasizes veterinary public health.

VETMED 550 Animal Health and Disease: Part I (Foundation Course V)

Spring. 10 credits. Limited to second-year veterinary students. Prerequisite: VETMED 540 Host, Agent, and Defense. Letter grades only. D. M. Ainsworth.

This course integrates the clinical sciences of medicine, surgery, anesthesiology, radiology, and theriogenology, which are themselves integrated subjects, with systems pathology and relevant aspects of applied pharmacology. The course will be presented on a systems basis moving from clinical signs of alteration in function, to pathophysiology of clinical signs, to strategies for diagnosis and treatment. Specific examples will be used to establish a cognitive framework and knowledge of the most important diseases. This course will

provide a sound foundation for clinical rotations in Foundation Course VI. It builds on the strengths developed in earlier courses by an increased exposure to case examples in a more directed way, taking advantage of the diversity of skills and special knowledge of both faculty and students. A variety of educational techniques will be used, including lectures in which interaction is encouraged, laboratories, demonstrations, case discussions, and autotutorials.

VETMED 551 Animal Health and Disease: Part II (Foundation Course V, continued)

Fall. 20 credits. Limited to third-year veterinary students. Prerequisite: VETMED 550 Animal Health and Disease: Part I. Letter grades only. D. M. Ainsworth and staff.

A continuation of VETMED 550 Animal Health and Disease: Part I.

VETMED 557 Animals, Veterinarians and Society: Part E (Foundation Course VIle)

Spring. 1 credit. Limited to second-year veterinary students rolling over into fall semester for the then third-year veterinary students. Prerequisite: VETMED 547 Animals, Veterinarians, and Society: Part D. Letter grade only. A fee of approximately \$14 is charged for the course guide. Staff.

This course is a correlate with Foundation Course V, Animal Health and Disease. The course will examine governmental regulation of the veterinary profession, including proper drug usage, extra label drug use (FDA), controlled substances (DEA), substance abuse, professional liability and malpractice insurance, professional and unprofessional conduct, hazardous materials in the workplace (OSHA), and environmental issues (EPA). Also included will be sessions relating to controlling and preventing the spread of animal diseases and the role of USDA and specifically APHIS in these regulatory functions.

VETMED 560 Ambulatory and Production Medicine I

Fall, winter, spring and summer. Credit variable (either one or two credits). Letter grades only. M. E. White and staff.

A clinical service rotation in which students accompany ambulatory clinicians on farm and stable calls and learn the skills and procedures necessary for operation of a modern veterinary practice offering primary care to large-animal clients. Routine herd health visits are conducted for cattle, horses, sheep, goats, and swine. Reproductive evaluations (including pregnancy and fertility examinations), nutritional evaluation, and disease prevention are stressed. Herd health programs also include vaccinations, parasite control, mastitis prevention, and routine procedures. With appropriate herds, analysis of computerized performance data is conducted and discussed with the owner. In addition to assisting with routine scheduled work, students participate in diagnosis and medical or surgical treatment of ill or injured animals. This includes rotating assignments for night and weekend duty.

VETMED 561 Community Practice Service—Medicine (enroll in VETMED 561)

2 credits. Required component of Clinical Rotations (Foundation Course VI). Letter grades only. W. E. Hornbuckle and staff. The Community Practice—Medicine Service is structured to provide supervised clinical

experience in the practice of small companion animal medicine. The course is conducted in the Small Animal Clinic of the Cornell University Hospital for Animals. Students interact directly with clients presenting their pet for primary medical care. Under the supervision of the clinical faculty and staff, the students are expected to formulate and carry out plans for the diagnostic evaluation and medical management of these patients. After review, students explain their plans to the clients and provide follow-up care and management of these patients.

VETMED 562 Community Practice Service—Surgery and Anesthesiology

2 credits. Required component of Clinical Rotations (Foundation Course VI). Letter grades only. H. J. Harvey and staff.

Basic principles of anesthesiology and surgery are emphasized in the clinical rotation. Under direct staff supervision, students will anesthetize and perform surgical procedures on patients presented to the Small Animal Clinic for neutering and minor elective procedures. Students will be responsible for all aspects of patient care during their hospital stay and will be expected to fully participate in client communications. Ordinarily, this course will precede Anesthesiology Service and Small Animal Surgery Service (soft tissue component).

VETMED 563 Small Animal Medicine

Fall, spring, winter, and summer. 4 credits. Required course open to second-semester third-year and all fourth-year veterinary students; not open to others. Letter grades only. S. C. Barr, S. A. Center, J. F. Randolph, and K. W. Simpson.

The Small Animal Medicine Service is structured to provide supervised clinical experience in the practice of companion small animal medicine. The course is conducted in the Small Animal Clinic of the Cornell University Hospital for Animals. Students interact directly with clients presenting their pets for primary or referral medical care. Under the supervision of the clinical faculty and staff, the students are expected to formulate and carry out plans for the diagnostic evaluation and medical management of these patients. After review, students explain their plan to the clients and provide follow-up care and management of these patients.

VETMED 564 Small Animal Surgery Service

Fall, winter, spring, and summer. 4 credits. Required of all third- and fourth-year veterinary students; not open to others. Letter grades only. H. J. Harvey and small animal surgery faculty.

A clinical service rotation, this course exposes the student to the practice of surgery under hospital conditions. Students participate in the diagnostic techniques; planning of therapy; and daily care of dogs, cats, and exotic species under the direction of a faculty veterinarian. Students assist experienced surgeons in the operating room and, with house-officer supervision, are responsible for patients undergoing elective ovariohysterectomy or castration. Client communications and the basics of efficient practice are emphasized.

VETMED 565 Ambulatory and Production Medicine II

Fall, winter, spring, and summer. 4 credits. Required component of Clinical Rotations (Foundation Course VI). Letter grades only. M. E. White and staff.

A clinical service rotation in which students accompany ambulatory clinicians on farm and stable calls and learn the skills and procedures necessary for operation of a modern veterinary practice offering primary care to large animal clients. Routine herd health visits are conducted for cattle, horses, sheep, goats, and swine. Reproductive evaluations (including pregnancy and fertility examinations), nutritional evaluation, and disease prevention are stressed. Herd health programs also include vaccinations, parasite control, mastitis prevention, and routine procedures such as castration and dehorning. With appropriate herds, analysis of computerized performance data is conducted and discussed with the owner. In addition to assisting with routine scheduled work, students participate in diagnosis and medical or surgical treatment of ill or injured animals. This includes rotating assignments for night and weekend duty.

VETMED 566 Large Animal Medicine Service

Fall, winter, spring, and summer. 3 credits. Required component of Clinical Rotations (Foundation Course VI). Letter grades only. D. Ainsworth, T. Divers, and staff.

Students assigned to this service will assist the faculty and house staff of the Large Animal Medicine service in the diagnosis and care of patients. The goal of this course is for students working on this service to acquire knowledge and skills in history taking, physical examination, election and completion of appropriate ancillary tests, diagnosis, treatment, and patient care. Daily rounds and discussions are used to monitor patient progress and further educate students.

VETMED 567 Large Animal Surgery Service

Fall, winter, spring, and summer. 4 credits. Required component of Clinical Rotations (Foundation Course VI). Letter grades only. A. J. Nixon and staff.

This clinical rotation is structured to provide supervised clinical experience in the practice of large animal surgery. Under the direction of faculty and house staff, students participate in the diagnosis, surgical treatment, and care of patients presented to the Large Animal Clinic. Training through patient care is supplemented by formal rounds and didactic instruction.

VETMED 568 Anesthesiology Service

Fall, winter, spring, and summer. 3 credits. Required component of Clinical Rotations (Foundation Course VI). Letter grades only. R. D. Gleed, J. W. Ludders, P. F. Moon, and staff.

This course is designed to provide clinical experience in the use of anesthetics in small companion animals, horses, and some food animals. The students participate in selecting suitable anesthetic techniques for patients in the Cornell University Hospital for Animals and then implement those techniques under the supervision of faculty and residents. The goal is for students to learn the skills and thought processes necessary to perform safe anesthesia in a modern veterinary practice.

VETMED 569 Dermatology Service

Fall, winter, spring, and summer. 2 credits. Required component of Clinical Rotations (Foundation Course VI). Letter grades only. W. H. Miller and D. W. Scott.

During this clinical rotation, students participate in the diagnosis and management of skin disorders in small and large animals. Patients are examined by appointment and through consultation with other hospital services.

VETMED 570 Ophthalmology Service

Fall, winter, spring, and summer. 2 credits. Required component of Clinical Rotations (Foundation Course VI). Letter grades only. R. C. Riis, T. Kern, and N. Irby.

This course combines clinical experience with beginning skills in diagnostic ophthalmology. Students learn how to apply the ophthalmic diagnostic tests. A competent ocular examination is the goal of this rotation. Confidence in using direct and indirect ophthalmoscopes, slit lamps, tonometers, gonioscopes, conjunctival cytology, and surgery comes with the practice provided by this rotation. Students are required to review the introductory orientation videotapes in the Autotutorial Center titled *Ocular Examination I and II* before the start of the rotation. This rotation provides surgical experience and consultations. A high percentage of the consultations are referral cases that usually challenge the service. Adequate routine case material is presented to prepare most students for practice.

VETMED 571 Pathology Service

Fall, winter, spring, and summer. 2 credits. Required component of Clinical Rotations (Foundation Course VI). Letter grades only. B. A. Summers and staff.

This course involves the hands-on diagnostic necropsies of most mammalian species that are presented to the pathology necropsy room and of avian species that are admitted to the avian and aquatic animal medicine necropsy room. Students work in groups of three to five for the two-week rotation. Necropsies are performed under the guidance of pathology faculty and residents. Students prepare written reports of necropsies performed, review microscopic hematology and cytology slides, perform urinalyses, and discuss case studies.

VETMED 572 Radiology Service

Fall, winter, spring, and summer. 2 credits. Required component of Clinical Rotations (Foundation Course VI). Letter grades only. N. L. Dykes and staff.

A two-week clinical experience in the Imaging Section of the Cornell University Hospital for Animals. Students will use radiographic, CT, ultrasonographic, and nuclear medicine imaging techniques to evaluate animal patients under treatment in the Cornell University Hospital for Animals. Students obtain and interpret radiographic and ultrasonographic studies with guidance from radiology faculty and technical staff. Two 3-hour laboratory sessions are given to allow hands-on experience in patient positioning and radiographic technique. An autotutorial teaching film file is used to familiarize students with radiographic examples of common diseases of large and small animal species. Small-group discussions are scheduled to present and discuss current cases. The safe use of x-ray-producing equipment and radioisotopes is discussed.

VETMED 573 Fourth-Year Seminar

Fall and spring. 1 credit. Required of all fourth-year veterinary students. First-, second-, and third-year students and all staff members are also invited and encouraged to attend. S-U grades only. F. H. Fox, chair of the Senior Seminar Committee.

The aim of this course is to give the student the responsibility and opportunity of selecting and studying disease entity on the basis of a case or series of cases, or to conduct a short-term, clinically oriented research project under the direction of a faculty member. In either case, an oral report will be presented at a weekly seminar. A written report will also be submitted at the time of the seminar. All participants are encouraged to foster an atmosphere in which discussion, exchange of ideas, and the airing of controversial opinions might flourish.

DISTRIBUTION COURSES

Distribution courses comprise 30 percent of the curriculum and are usually scheduled during the first half of each spring semester. During the first two years, many of the distribution courses are oriented to the basic sciences. During years three and four, students have additional distribution course offerings from which to choose. Some will emphasize clinical specialties, whereas others will integrate basic science disciplines with clinical medicine and will be co-taught by faculty representing both areas. Students from different classes have the opportunity to take many of these courses together.

Grades: Grading options for distribution courses are either letter or S-U.

VETMED 601 Anatomy of the Carnivore

Spring. 3 credits. Prerequisite: VETMED 510 The Animal Body or permission of instructor. First-, second-, third-, and fourth-year veterinary students; others by permission. Letter grades only. A. J. Bezuidenhout.

Carnivore anatomy is studied by detailed systematic and regional dissection of the cat, with comparison to the dog. Student dissection is supplemented with prosections, radiographs, and exercises focusing on surgical approaches. There are opportunities to dissect other carnivores, such as the ferret and the fox, depending on availability of specimens. The lectures augment the laboratory dissection and introduce the student to functional morphological comparative features in the Order Carnivore. Students do an independent research project on the carnivore species of their choice and give an oral presentation on this to the class.

VETMED 602 Anatomy of the Horse

Spring. 3 credits. Prerequisite: VETMED 510 The Animal Body or permission of instructor. First-, second-, third-, and fourth-year veterinary students; others by permission. Letter grades only. M. S. Hackett.

This course is organized as a traditional anatomy course that relies primarily on students learning the anatomy of horses through hands-on dissection laboratories augmented by lectures and highlighted by clinical correlations. An understanding of anatomy that provides the foundation for surgery and is directly relevant to clinical

practice will be emphasized in the regional approach to dissection. Most lectures will emphasize structural-functional correlations that are unique or important in the horse. Microscopic anatomy will be integrated into the course in selected areas to lay a foundation for the later study of pathology or when it reinforces concepts of structure and function that are difficult to understand by a study of the gross anatomy alone (i.e., hoof). Student dissection cadavers will be supplemented by skeletal materials, radiographs, models, preserved predissected specimens, and fresh specimens when they are available.

VETMED 603 Anatomy of the Ruminant

Spring. 3 credits. Prerequisite: VETMED 510 The Animal Body or permission of instructor. First-, second-, third-, and fourth-year veterinary students; others by permission. Letter grades only. J. Hermanson.

The regional anatomy of several ruminant species will be covered using dissection laboratories, lectures, and large-group discussions. Functional consequences of structural modifications and anatomical features directly relevant to clinical practice will be emphasized. Microscopic anatomy will be correlated with gross anatomy when appropriate to relate structure to function and to provide a foundation for later study in pathology. Student dissection material will be supplemented by skeletal materials, radiographs, models, predissected specimens, and postmortem specimens. Students will be required to complete an independent study project on a relevant subject of their choice. Assessment includes written and practical examination.

VETMED 605 Comparative Anatomy: Pattern and Function

Spring. 3 credits. Prerequisite: VETMED 510 The Animal Body. First-, second-, third-, or fourth-year veterinary students; others by permission. Letter grades only. L. A. Mizer.

The goal of this course is to study anatomical variability among amniote (mammals, birds, and reptiles) and anomniote (amphibian and fish) species. This is accomplished by relating the anatomy of major organ systems in each species to a common basic pattern and considering the differences in a functional perspective. Five major systems will be explored (integumentary, locomotory, cardiorespiratory, digestive, and urogenital) in a variety of species as available.

VETMED 606 Advanced Clinical Neurology

Spring. 1 credit. Prerequisite: VETMED 521 Neuroanatomy and Clinical Neurology. Third- and fourth-year veterinary students. Letter grades only. A. deLahunta.

The objective of this course is to further the experience and confidence of the student in the diagnosis and understanding of clinical neurological disorders. It continues their correlation of anatomy, physiology, and pathology in the diagnosis of diseases of the nervous system and the understanding of their pathogenesis. Neurological disorders that are not covered in the foundation course will be considered here. The course is entirely based on case examples that are presented on videotapes and slides.

VETMED 607 The Literature and Subject Matter of Natural History

Spring. 1 credit. First-, second-, third-, and fourth-year veterinary students; others by permission. S-U grades only. H. E. Evans. This course is an introduction to classic and current natural history literature. Materials relating to the earth sciences and the biology of plants and animals from around the world will be shown and discussed. Students will be required to show and discuss a book that concerns natural history in a country of their choice. A recommended reference text for this course is *The Cambridge Illustrated Dictionary of Natural History* by R. J. Lincoln and G. A. Boxshall, 1990.

VETMED 609 Anatomy and Histology of Fish

Spring. 2 credits. Minimum enrollment 4; maximum enrollment 6. First-, second-, third-, and fourth-year veterinary students, others by written permission of instructor. S-U grades optional. P. R. Bowser.

This course provides an overview of the diversity of anatomy and histology of fish. Students will participate in lecture, discussion, and laboratory exercises to review the major organ systems. Extensive use of library resources for assigned readings will be expected. Each student will prepare a term project and make one oral presentation.

[VETMED 610 Veterinary Aspects of Avian Biology]

Spring. 1 credit. Minimum enrollment 10; maximum enrollment 60. First-, second-, third-, and fourth-year veterinary students; others by permission. Letter grades only. Offered even-numbered years. Next offered spring 2002. N. Abou-Madi.

An introduction to avian biology for veterinary students. The course will include lectures and laboratories involving avian evolution, anatomy, physiology, and ecology. Emphasis will be on the development of a strong foundation in avian biology that will be applied in VETMED 616 Diseases of Birds and VETMED 652 Avian Medicine and Surgery.]

VETMED 611 Fish Health Management

Spring. 1 credit. Minimum enrollment 8; maximum enrollment 16. First-, second-, third-, and fourth-year veterinary students; others by written permission of instructor. S-U grades optional. Offered odd-numbered years. P. R. Bowser.

This course will present a summary of important diseases of fin fishes. Diseases covered will be those of importance in commercial aquaculture as well as those encountered by the tropical fish hobbyist. The course is designed to provide the students with a knowledge base and hands-on diagnostic experience in diseases of fish. Each student will prepare a term project and make one oral presentation.

[VETMED 612 Management of Aquarium Systems]

Spring. 1 credit. Minimum enrollment 8; maximum enrollment 16. First-, second-, third-, and fourth-year veterinary students; others by written permission of instructor. S-U grades optional. Offered even-numbered years. P. R. Bowser.

This is a lecture and laboratory course dealing with procedures and practices involved in management of aquarium systems. Topics include water quality, types of aquarium filtration systems, fish health, fish nutrition, and general fish biology. A portion of the

course will require independent work in aquarium system management. Each student will prepare a term project and make one oral presentation.]

VETMED 613 Aquavet I: Introduction to Aquatic Veterinary Medicine

Four weeks of full-time instruction at Woods Hole, Massachusetts, immediately after the spring term. 4 credits. Maximum enrollment 24 students from Cornell University, the University of Pennsylvania, and other U.S. colleges and schools of veterinary medicine. Available, by a competitive application process, to veterinary and graduate students. S-U grades only. Course fee required. P. R. Bowser.

The course is sponsored by Cornell University, the University of Pennsylvania, and three marine science institutions at Woods Hole: the Marine Biological Laboratory, Woods Hole Oceanographic Institution, and Northeast Center of the National Marine Fisheries Service. It is designed to introduce veterinary students to aquatic animal medicine. The marine environment is described and visited on field trips in the Woods Hole area. Specific aspects of the comparative anatomy, physiology, nutrition, microbiology, pathology, and medicine of a variety of marine and freshwater species are discussed. Some emphasis is placed on systems of aquaculture. The specific diseases of a few selected species are presented as examples, including the diseases of a crustacean, a shellfish, a finfish, and marine mammals. The course is taught by an invited faculty of 35 individuals who are leaders in their respective fields of aquatic animal medicine. Students present seminars on appropriate topics.

VETMED 614 Aquavet II: Comparative Pathology of Aquatic Animals

Two weeks of full-time instruction at Woods Hole, Massachusetts, immediately after the spring term. 2 credits. Prerequisites: formal course work in diseases of aquatic animals or appropriate experience and permission of instructor. Maximum enrollment 18. S-U grades optional. Course fee required. Available, by a competitive application process, to veterinary and graduate students. P. R. Bowser.

This course is sponsored by Cornell University, the University of Pennsylvania, and three marine science institutes at Woods Hole: the Marine Biological Laboratory, Woods Hole Oceanographic Institution, and Northeast Center of the National Marine Fisheries Service. It is an advanced course in the comparative pathology of aquatic invertebrates and vertebrates commonly used as laboratory animals. The material presented will consist of discussions of the diseases of aquatic animals as well as extensive use of the microscope to examine the histopathology associated with these diseases. The course is taught by an invited faculty of 12 individuals who are leaders in their respective fields of aquatic animal medicine.

VETMED 615 Veterinary Medicine in Developing Nations

Spring. 2 credits. Maximum enrollment 20. First-, second-, third-, and fourth-year veterinary students; others by permission of instructor. S-U grades only. Offered odd-numbered years. K. A. Schat.

Veterinary medicine has an important role to play in developing nations in (1) developing

and providing economical sources of animal proteins for human consumption and (2) protecting ecological resources. This seminar course will provide interested veterinary students with information on and insight into the multitude of complex issues facing U.S. veterinarians working in developing nations.

VETMED 616 Diseases of Birds

Spring. 2 credits. Minimum enrollment 10; maximum enrollment 80. Second-, third-, and fourth-year veterinary students. Letter grades only. S. Naqi and G. V. Kollias.

This course is designed to introduce second-, third-, and fourth-year veterinary students to a basic and practical knowledge of the most common infectious and noninfectious diseases affecting a variety of avian species. The course will emphasize the latest diagnostic and control approaches. The course format will be a combination of didactic lectures and discussions.

VETMED 618 Adaptation of Animals to the Environment

Spring. 1 credit. Minimum enrollment 10. Graduate and first-, second-, third-, and fourth-year veterinary students. Letter grades only. D. Robertshaw.

The course will examine the physiological adaptations of animals to their environment in addition to methods of acclimatization to novel environments. The course will focus on environmental parameters that exist in harsh environments and include heat, cold, altitude, and xeric conditions. Thus the physiological mechanisms of thermoregulation in mammals, birds, and ectotherms will be examined together with their responses to low food and water availability. The knowledge obtained will help in understanding the consequences of translocation of both wild and domestic animals and provide a rational basis for animal housing and the provision of appropriate habitats for zoological gardens. The degree of environmental adaptation will also be examined in terms of animal production from a basic science standpoint.

[VETMED 619 Pathogenesis of Viral Disease (also VETMI 701)]

Spring. 2 credits. Minimum enrollment 15; maximum enrollment 45. Strongly recommended prerequisite of immunology. First-, second-, third-, and fourth-year veterinary students. Letter grades only. Offered odd-numbered years. Next offered spring 2003. J. D. Baines.

Course content and objectives: the course will focus on the balance between host defense against viral infections and the mechanisms by which viruses perpetuate themselves in human and animal populations. In the process, the mechanisms of cell and animal infection, spreading between cells, disease mechanisms, and the roles of the immune response in enhancing and suppressing disease will be explored. This will include a systems-based approach exploring the pathogenesis of disease in the CNS, gastrointestinal, hepatic, tegumentary, respiratory, and urogenital systems. The basic principles of virus taxonomy, structure and replication will be included to introduce various viral groups and their special properties. Methods of intervention (vaccination, antiviral drugs) will also be covered. Lectures are derived from relevant current literature, the text, Nathanson's *Viral Pathogenesis*, 1997, and Field's *Virology*, third edition, 1996. Relevant materials will be placed on reserve in the veterinary library.]

[VETMED 620 Molecular Biology and Immunology of Host-Parasite Interactions (also VETMI 702)]

Spring. 2 credits. First-, second-, third-, and fourth-year veterinary students, others by permission of the instructor. Letter grades only. Offered even-numbered years. E. J. Pearce.

The primary objective of this lecture course is to make the student aware of the most important areas of research in contemporary parasitology. Lectures will focus on a broad range of parasites, with an emphasis on those of medical importance. Recently published research articles and reviews will be used as the basis from which to explore the issues of host invasion, evasion of host defense mechanisms by parasites, vaccination against parasitic infections, chemotherapy, drug resistance, vector biology, and molecular diagnosis. Biological processes that are especially well understood through work on parasites, such as RNA editing and GPI-anchor biosynthesis and structure, will be covered in detail.]

[VETMED 622 Foreign Infectious Diseases of Animals]

Spring. 1 credit. Minimum enrollment 6. Second-, third-, and fourth-year veterinary students. Letter grades only. Not offered 2000-2001. D. H. Schlafer.

This course describes the etiology, pathogenesis, clinical signs, gross pathology, differential diagnosis, methods of spread, reservoir hosts, and control of foreign animal diseases that present serious economic threats to the United States. The format is student seminar presentations with each student responsible for presenting one seminar. Ordinarily the course will also include presentations by college faculty and research scientists working on foreign infectious diseases.]

VETMED 624 Feline Infectious Diseases

Spring. 1 credit. Minimum enrollment 10; maximum enrollment 80. Second-, third-, and fourth-year veterinary students. Letter grades only. S. C. Barr.

The course consists of two 50-minute lecture periods a week for eight weeks. The letter grade will be obtained entirely from the result of a written examination (usually multiple choice format) given in the final period. The course will emphasize the clinical aspects of the more common feline infectious diseases common to cats in North America and will complement knowledge acquired in Blocks IV and V. The overall objective is to provide details about specific infectious diseases a future small animal practitioner may need to know to effectively diagnose and treat diseases. Etiology, epidemiology (prevalence and transmission), pathogenesis, clinical findings, diagnosis, pathologic findings, therapy prevention, and public health considerations will be emphasized. Most lectures will be presented from a clinician's point of view and therefore the material will be oriented towards practical skills in managing clinical cases.

VETMED 625 Osteoarthritis

Spring. 1 credit. Maximum enrollment 16. Graduate and second-, third-, and fourth-year veterinary students. Letter grades only. G. Lust.

This course provides a basis at the molecular, cellular, and tissue levels for understanding the function of mammalian diarthrodial joints. It includes a description of a diarthrodial joint and the composition and metabolism of articular cartilage, subchondral bone,

ligaments, meniscus, capsule, and synovium. The interrelationships of synovium, synovial fluid, articular cartilage, joint lubrication, biomechanical considerations, and enervation are considered. Canine hip dysplasia is a focus during the early class sessions. The osteoarthritis that is associated with canine hip dysplasia serves as a basis for discussion of the etiopathogenesis of the disease. Canine osteoarthritis will be emphasized, but the disease in animal models such as mice, guinea pigs, rabbits, and sheep will be mentioned. Therapies, such as nonsteroidal anti-inflammatory drugs, glucocorticoids, and others may be discussed.

VETMED 626 Epidemiology of Infectious Diseases

Spring. 1 credit. Maximum enrollment 8. Second-, third-, and fourth-year veterinary students. Letter grades only. H. Mohammed and staff.

This course will introduce the epidemiologic methods used in infectious disease investigations. The importance of surveillance systems in detecting modern epidemics and in the development of effective disease prevention and control strategies will also be discussed. An emphasis will be placed on understanding the relationships between the host, the agent, and the environment as they relate to disease causation. The course will explore contemporary epidemiologic methods applicable to old diseases that remain real or potential problems, newly emerging infectious diseases, and nosocomial infections. Selected diseases will be discussed to clarify the role of epidemiology in understanding the pathogenesis of infectious processes in individuals and groups of animals. The students will have the opportunity to apply the methods learned to actual disease problems and write an epidemiologic report that might lead to a publication in a peer-reviewed scientific journal.

VETMED 627 Diseases of Antiquity

Spring. 1 credit. Second-, third-, and fourth-year veterinary students. Letter grades only. Staff.

This is a study of 36 human and animal diseases that have had profound effects on the course of human history from the beginning of recorded time to the present. This course combines aspects of literature, medicine, and history and explores the interactions between demographics, commerce, imperialism, medical care, the environment, and disease. Prevailing superstitions and religious views are considered in context with each illness and simultaneously occurring world events.

VETMED 628 Clinical Pathology

Spring. 2 credits. Minimum enrollment 20; maximum enrollment 60. Second-, third-, and fourth-year veterinary students. Letter grades only. Not offered 2000–2001. Staff.

This six-week course addresses a range of issues related to laboratory medicine and interpretation of laboratory results. General topic areas include hematology, clinical chemistry and immunology, and urinalysis. The primary mode of instruction is student-driven small-group (untutored) exploration of case materials followed by faculty-moderated large-group discussions. Selected lectures and laboratory sessions will supplement and expand on issues generated by the case discussions. This course builds on concepts previously addressed in Block 3 and 4 and also provides additional experiences in

practical clinical pathology procedures and microscopy.]

VETMED 630 Clinical Biostatistics for Journal Readers

Spring. 1 credit. Minimum enrollment 6; maximum enrollment 20. First-, second-, third-, and fourth-year veterinary students; others by permission of instructor. Letter grade. H. N. Erb.

The student will become familiar with the statistical methods commonly used in veterinary clinical articles, will be able to recognize obvious misuse of those methods, and will be able to interpret the statistical results.

VETMED 631 Clinical Diagnostic Parasitology

Fall and spring. 0.5 credit. Prerequisite: VETMED 551. Third- and fourth-year veterinary students. S-U grades only. TBA with Dr. Frongillo. D. D. Bowman and M. K. Frongillo.

This course will provide a chance to perform diagnostic parasitology methods using samples obtained from ongoing clinic cases. Students will attend eight 1-hour sessions as they rotate through the ambulatory, community practice, and pathology rotations. In the ambulatory service (four sessions with students), diagnostics will concentrate on the laboratory examination of samples from large animal cases that have been observed during the previous week. In the Community Practice Service, one hour will concentrate on the examination of samples from ongoing cases, while a second hour will consist of a discussion of the treatment of common endo- and ectoparasites. The two hours spent as part of the pathology rotation will examine methods of recovering parasites from pathology specimens, including the examination of wet preparations and the digestion of tissues for parasite recovery. The course is considered to be a logical extension to the foundation course Host, Agent, and Defense and is expected to build on the didactic material presented in Large and Small Animal Parasitology.

VETMED 632 Senior Seminar

Fall and spring. 1 credit. First-, second-, and third-year veterinary students. S-U grades only. Must be completed in two consecutive terms (either fall to spring or spring to fall). R. O. Gilbert.

Attendance at 14 of the senior seminar sessions presented during the academic year constitutes acceptable completion of this course.

This course does *not* fulfill the 1-credit Set VII minimum.

VETMED 633 Introduction to Nontraditional Companion and Laboratory Animals

Spring. 1 credit. First-, second-, third-, and fourth-year veterinary students. Letter grades only. Staff.

This course is both laboratory and lecture based and deals with a wide variety of nontraditional species, other than dogs or cats, that might be brought into a small-animal practice. These can be either companion or laboratory animals and include rodents, lagomorphs, other small mammals, reptiles, amphibians, birds, fish, goats, sheep, potbellied pigs, primates, and llamas. Instruction in restraint and handling, breeding, husbandry, and general management information is provided for each species. This

is followed, where possible, by laboratory sessions for observation, restraint, and physical examination.

VETMED 635 Introduction to the Professional Literature

Spring. 1 credit. Minimum enrollment 6; maximum enrollment 20. First-, second-, third-, and fourth-year veterinary students. Letter grades only. D. Lee.

This course introduces veterinary students to the professional and biomedical literature, including development of critical reading skills. Students will become familiar with the broad range of professional and biomedical literature and will be encouraged to develop a rigorous approach to journal and scientific article review. Secondary emphasis is on developing skills in library and bibliographic search techniques, as well as exploring the use of veterinary-related on-line information.

VETMED 637 Introduction to Community Practice Service

Fall, winter, spring, and summer. 1 credit. First- and second-year veterinary students by permission of instructor. S-U grades optional. W. E. Hornbuckle.

This course introduces veterinary students to primary care small-animal clinical practice through direct exposure to the Community Practice Service of the Cornell University Hospital for Animals. Students observe and assist with restraint, examination and routine treatment of pets, and communication with clients. Successful completion requires satisfactory participation during 10 half-days of clinical service.

VETMED 638 Physiological Nutrition

Spring. 1 credit. Minimum enrollment 10; maximum enrollment 90. Second-, third-, and fourth-year veterinary students; others by permission of instructor. Letter grades only. F. A. Kallfelz.

This course will provide information on the evaluation and formulation of rations for large and small animals. These concepts will be applied in discussion on the nutrition requirements of these animals during maintenance, gestation, lactation, growth, stress, and aging. The course is recommended for all second-year veterinary students who do not have a strong background in ruminant, equine, canine, and feline nutrition. This course, or its equivalent, will be necessary for comprehension of clinical nutrition concepts in Foundation Course V.

VETMED 639 Veterinary Dentistry

Spring. 1 credit. Maximum enrollment 96. Second-, third-, and fourth-year students. Letter grades only. Staff.

This is an introductory-level course in small animal dentistry. It is a laboratory course that meets for two hours twice a week for 16 sessions. Basic concepts and practical topics in dental nomenclature, dental anatomy, oral/dental examination, routine dental care including prophylaxis, recordkeeping, genetics and breed differences, feline-specific dental disease, occlusion/malocclusion, periodontics, endodontics, restorative dentistry, oral surgery, and orthodontics are presented. Basic instrumentation, dental radiography, and materials used in dentistry are stressed. The class will use prepared specimens for all sessions.

VETMED 640 Veterinary Aspects of Captive Wildlife Management

Spring. 2 credits. First-, second-, third-, and fourth-year veterinary students. Letter grades only. N. Abou-Madi.

This course will concentrate on principles of captive wildlife management, both clinical and nonclinical. Students will be challenged to learn and integrate a variety of disciplines that are essential to managing wildlife successfully in a captive or semi-free-ranging environment. These disciplines include but are not limited to species-specific (1) behavior and behavioral requirements, (2) nutritional requirements and problems, (3) natural history, (4) zoonotic and toxicological problems, (5) manual restraint and anesthesia, (6) preventive medicine, and (7) medical and legal ethics. In even-numbered years the course will emphasize non-North American wildlife species (examples include African, Asian, Australian, Central and South American species), and in odd-numbered years the course will focus more on the North American (native) wildlife species.

VETMED 641 Approaches to Problems in Canine Infectious Diseases

Spring. 1 credit. Minimum enrollment 10; maximum enrollment 80. Second-, third-, and fourth-year veterinary students. Letter grades only. S. C. Barr.

The course consists of two 50-minute lecture periods each week for eight weeks. The letter grade will be obtained entirely from the result of a written examination (usually multiple choice format) given in the final period. The course will emphasize the clinical aspects of the more common canine infectious diseases that are not covered in Foundation Course IV or V. The overall objective is to provide details about specific infectious diseases a future small animal practitioner may need to know to effectively diagnose and treat these diseases. Clinical signs, presentation, clinicopathologic data, diagnostic choices, treatment plans, and prevention will be emphasized. Most lectures will be presented by clinical faculty and therefore the material will be oriented toward practical skills in managing clinical cases.

VETMED 642 Management of Fluid and Electrolyte Disorders

Spring. 2 credits. Minimum enrollment 20; maximum enrollment 40. Second-, third-, and fourth-year veterinary students. Letter grades only. D. F. Smith.

Students will focus on clinical manifestations and the pathophysiologic mechanisms associated with fluid, electrolyte, and metabolic acid base disturbances in domestic animals. The course is divided into segments dealing with salt and water imbalances, potassium abnormalities, metabolic acidosis, metabolic alkalosis, and mixed acid-base disturbances.

VETMED 643 Fundamental Aspects of Embryo Transfer

Spring. 1 credit. Maximum enrollment 16. Enrollment is done by lottery. Third- and fourth-year veterinary students or graduate students by permission of instructor. S-U grades only. J. R. Hill.

This course introduces the theory and practice of embryo transfer in domestic animals. Topics include background, advantages and disadvantages, superovulation, embryo recovery techniques, embryo culture and manipulation, embryo transfer techniques, registration of offspring, import and export,

and related topics in assisted reproductive technologies. Students are exposed to practical techniques of embryo transfer in cattle, small ruminants, horses, and swine. The course consists of lectures, demonstrations, and laboratory classes during which students practice techniques of embryo recovery, evaluation, handling, and transfer.

VETMED 644 Equine Surgical and Anesthetic Techniques

Winter. 1 credit. Prerequisite: VETMED 602 Anatomy of the Horse. Minimum enrollment 3; maximum enrollment 21.

Enrollment is done by lottery. Third- and fourth-year veterinary students. S-U grades only. S. L. Fubini (coordinator) and other large-animal surgeons.

This course consists of five laboratories performing surgical procedures on ponies and cadaver specimens. It is the intent of this course not to make the students proficient in these procedures but to familiarize them with some specialized surgical techniques and to make them more enlightened referring practitioners. The course, therefore, is intended for students anticipating equine practice after graduation. This course is offered during a one-week period over winter intersession.

VETMED 645 Food Animal Surgical and Anesthetic Techniques

Winter. 1 credit. Prerequisite: VETMED 603 Anatomy of the Ruminant. Minimum enrollment 6; maximum enrollment 30.

Third- and fourth-year veterinary students. S-U grades only. Enrollment is done by lottery. S. L. Fubini and other large-animal surgeons.

This course consists of five laboratories performing surgical procedures on sheep, calves, cadaver specimens, and adult cattle. It is the intent of this course not to make the students proficient in these procedures but to familiarize them with surgical techniques and to make them more enlightened referring practitioners. The course, therefore, is intended for students anticipating food animal practice after graduation. This course is offered during a one-week period over winter intersession.

VETMED 646 Llama Tutorial

Fall, spring, summer. 1 credit. Prerequisite: VETMED 540. Second-semester second-, third-, or fourth-year veterinary students. S-U grades only. Independent study. M. C. Smith.

This autotutorial or group tutorial course covers common problems of llamas and alpacas. Participants will be provided with study guides consisting of brief case descriptions and sample study questions. Reference will be made to textbooks, journal articles, videotapes, and (if available) a teaching llama to assist students in finding the answers to the questions efficiently. Grading is based on an oral exam.

VETMED 647 Poisonous Plants

Fall. 1 credit. First-, second-, third-, and fourth-year veterinary students; others by permission of instructor. S-U grades only. R. Hillman and M. Smith.

Field trips demonstrate toxic plants growing in natural or cultivated settings. Lectures address economically important poisonous plants native to the United States. Information presented includes plant identification, natural habitat, toxic principles, clinical signs of toxicity, and treatment and prevention of

poisoning in animals. Some of the major toxic principles found in plants and considered in detail in the course are nitrates, cyanide, oxalates, photodynamic agents, alkaloids, and mycotoxins.

VETMED 648 Clinical Management of Native Wildlife

Fall, spring, summer (credit given in fall). 1 credit. Enrollment not to exceed 20 students per semester, 2 students per rotation. First-, second-, third-, and fourth-year veterinary students by permission of instructor. Letter grades only.

N. Abou-Madi and staff.

This course introduces veterinary students to primary native wildlife care and to wildlife issues that practicing veterinarians face on a daily basis. Students are responsible for the assessment, physical examination, and medical care of native wildlife presented to the Cornell University Hospital for Animals by the public and local wildlife rehabilitators. Student activities are directly supervised and assessed by faculty wildlife clinicians on a daily basis. Successful completion of the course requires 40 hours of satisfactory supervised participation per semester in the clinic. Clinic times will be appropriately scheduled throughout the semester. Students are required to submit two case summaries before the end of the semester and a log of their clinical hours.

VETMED 649 Introduction to Equine Practice

Spring. 0.5 credit. Maximum enrollment 30. First- and second-year veterinary students. Letter grades only. R. Hackett and C. Collyer.

This is an introductory course in equine husbandry intended for students with little or no experience working with horses. Lecture topics will include horse breeds and colors, housing facilities and fencing, and overview discussions of the racing, showing, and breeding industries. Laboratories will emphasize basic equine handling and restraint as well as feeds and bedding.

VETMED 652 Avian Medicine and Surgery

Spring. 2 credits. Minimum enrollment 20; maximum enrollment 80. Third- and fourth-year veterinary students. Letter grades only. N. Abou-Madi and staff.

This course is designed to introduce third- and fourth-year veterinary students to the principles and practice of clinical avian medicine and surgery. The course will be taught in a basic didactic lecture and discussion format with laboratories that will reinforce concepts presented in the lectures.

VETMED 653 Advanced Equine Lameness

Spring. 1.5 credits. Minimum enrollment 7; maximum enrollment 21. Third- and fourth-year veterinary students. Enrollment is done by lottery. S-U grades only. N. Ducharme, A. Nixon, and staff.

This course is designed to help students understand the methodology and to develop the manual skills required for lameness examination in horses. Emphasis will be on developing diagnostic skills. Specifically, the student will be expected to develop proficiency in the identification of clinical characteristics associated with recognized lamenesses and to localize the origin of the lameness. Teaching aids will include video modules outlining various gait abnormalities.

In addition, horses with specific gait abnormalities will be available for physical, radiographic, and ultrasonographic examination.

VETMED 654 Current Therapy in Equine Reproduction

Spring. Lec, 1 credit; lab, 0.5 credit. Lab minimum enrollment 12; maximum enrollment 24. Laboratory enrollment is done by lottery, if oversubscribed; concurrent enrollment in lecture is required. Third- and fourth-year veterinary students. Letter grades only.

D. H. Volkmann and C. M. Schweizer.

This course covers advanced aspects of equine reproductive physiology. Reproductive management of mares and stallions using natural and artificial breeding strategies is discussed. Diagnosis, treatment, and prevention of common reproductive disorders are stressed. The laboratory component builds on skills acquired during Foundation Courses and provides experience in techniques important in equine theriogenology.

VETMED 655 Production Animal Theriogenology

Spring. Lec, 1 credit; lab, 1 credit. Lab, minimum enrollment 12; maximum enrollment 24. Laboratory enrollment is done by lottery. Concurrent enrollment in Production Animal Theriogenology Lecture is required. Third- and fourth-year veterinary students. Letter grades only.

J. R. Hill.

This course deals with specific reproductive disorders of production animals as well as reproductive management of production units. Content includes reproductive biology of production animals, economic considerations, and medical and surgical approaches to management of reproductive disorders. Laboratory sessions are tailored to acquisition of specific skills fundamental to the practice of theriogenology of production animals. Emphasis is on dairy cows.

VETMED 656 Special Problems in Equine Medicine

Spring. 1.5 credits. Minimum enrollment 10; maximum enrollment 30. Enrollment is done by lottery. Third- and fourth-year veterinary students. S-U grades only.

T. Divers and staff.

This course is intended for students who plan to or may enter equine practice. In-depth study of important diseases, review of recent literature, health management, and hands-on procedures or demonstrations will be the core of this course.

[VETMED 657 Disorders of Large Animal Neonates]

Spring. 1 credit. Minimum enrollment 10; maximum enrollment 100. First-, second-, third-, and fourth-year veterinary students. Letter grades only. Not offered 2000–2001.

D. Ainsworth.

The common medical problems of foals and calves, with emphasis placed on the neonatal period, are discussed. Specific topics examined in detail include disorders affecting the respiratory, gastrointestinal, and musculoskeletal systems. Students will also spend several hours in the neonatal intensive care unit providing medical care of hospitalized patients under staff supervision.]

VETMED 659 Equine Soft Tissue Surgery

Spring. 1 credit. Minimum enrollment 6; maximum enrollment 21. Third- and fourth-year veterinary students. Enrollment is done by lottery. Letter grades only.

R. Hackett and staff.

This course, intended for students anticipating equine practice after graduation, will build on material presented in the foundation courses to provide supplemental instruction in surgical disorders of the horse. Lectures will be case based and emphasize disorders likely to be encountered in equine practice (colic, traumatic injuries, upper respiratory tract disorders, prepurchase examination). Laboratories will emphasize diagnostic and therapeutic procedures in which an entry-level equine practitioner should be competent.

VETMED 661 Surgical Pathology

Spring, summer, fall. Variable 1–2 credits. Second-, third-, and fourth-year veterinary students with permission of instructor.

Letter grades only. S. McDonough.

This one- or two-week course (approximately eight hours per day for one credit per week) will provide hands-on experience in the Surgical Pathology Service of the Department of Biomedical Sciences. Working with the attending pathologist, students will examine tissue specimens histologically, propose diagnoses, and discuss their interpretations. Students may enroll in this course only through the Office of Student Records *within the official add/drop period*. All requests to enroll must be accompanied by the Supplemental Enrollment Form indicating Dr. McDonough's approval of the enrollment and the amount of credit to be awarded. *Second-year students* should not enroll for any term other than summer *unless* they have actually reserved a January or spring break slot through Dr. McDonough.

VETMED 665 Medical and Surgical Problems of Dairy Cattle—Emphasis on the Individual Animal

Spring. 1.5 credits. Minimum enrollment 6; maximum enrollment 28. Enrollment is done by lottery. Third- and fourth-year veterinary students. Letter grades only.

S. Fubini and staff.

This course will provide students with a special interest in dairy practice the opportunity for in-depth discussions of special problems in bovine medicine and surgery. Emphasis will be on case discussions, physical examination techniques, and ethical and practical matters. The course will emphasize individual cow treatment.

[VETMED 666 Small Animal Clinical Oncology]

Spring. 1 credit. Third- and fourth-year veterinary students. Letter grades only.

Not offered 2000–2001. H. J. Harvey.

This course will present common tumor syndromes in small animals. Emphasis will be placed on biological behavior, patient management, and client relations. Format will include lectures, journal club discussions, demonstrations, and seminars.]

VETMED 667 Special Problems in Small Animal Medicine

Spring. 1 credit. Minimum enrollment 10; maximum enrollment 40. Third- and fourth-year veterinary students. S-U grades only. K. Simpson and staff.

During the four-week course, students will work through cases in small-animal medicine. The course consists of a 50-minute weekly

discussion period. The focus will be on the medical problems associated with cases using historic, clinical, clinical pathologic, and pathologic findings to elucidate basic pathophysiologic principles of disease. The overall objective is to give future small-animal practitioners skills in the approach to clinical problems with specific emphasis placed on history taking, clinical signs and examination skills, assessment of clinical pathology data and diagnostic materials (radiographs, ultrasounds), treatment plans, and prevention. The course expands knowledge gained in Foundation Course V and, under the instruction of a clinical faculty member, is aimed at facilitating the use of that knowledge into the practical skills of managing clinical cases.

VETMED 668 Practice Management

Spring. 2 credits. Number of sections will be determined by enrollment. Third- and fourth-year veterinary students. S-U grades only. Staff.

Course participants form a veterinary group practice that includes the specialties of each person's interest. Topics are presented and discussed in the staff meeting format of the practice. Topics include basic practice organization, leadership styles, career planning, communication skills, facility management, human resource management, maintenance of standards, marketing and merchandising, building and maintaining clients, practice growth, finances, computing systems and information management, money management, legal issues and insurance, professional relations and responsibility, and maintaining an acceptable quality of life, including stress management. Various practitioners and practice managers will speak to the group about their very different successful practices, concentrating on management and organizational skills.

VETMED 669 Sheep and Goat Medicine

Spring. Lec, 1 credit; lab, 0.5 credit. Lab, concurrent enrollment in Sheep and Goat Medicine Lecture is required. Third- and fourth-year veterinary students. S-U grades only. M. Smith.

This course will discuss diagnosis, treatment, and prevention of medical and surgical problems of individual small ruminants and of sheep and goat herds. Basic information on breeds, behavior, nutritional requirements, and management systems will be supplied. Economically important contagious or metabolic diseases will be discussed in depth. The diagnostic evaluation and differential diagnoses for common clinical presentations such as skin disease, neurologic disease, lameness, and mastitis will be considered. Herd monitoring of economically important parameters and necropsy diagnosis of abortions and neonatal losses will be addressed. Breeding systems, pregnancy diagnosis methods, and correction of dystocias will be discussed and demonstrated in optional laboratory sessions.

VETMED 670 Drug Handling in the Body

Spring. 0.5 credit. Maximum enrollment 60. Second-, third-, and fourth-year veterinary students. Letter grades only. R. A. Cerione and G. A. Weiland.

This course will provide an in-depth consideration of the pharmacological principles of administration, adsorption, distribution, metabolism, and elimination of drugs. Emphasis will be on the conceptual basis of the pharmacokinetic considerations in the

therapeutic use of drugs. The course will build on the pharmacological and physiological principles introduced in Foundation Course III.

VETMED 671 Autonomic Pharmacology

Spring. 0.5 credit. Maximum enrollment 80. Second-, third-, and fourth-year veterinary students. Letter grades only. G. A. Weiland.

This course will provide an in-depth consideration of the pharmacological and physiological principles of autonomic pharmacology. Molecular, cellular, and organ system mechanisms will be emphasized. The course will explore in more detail the fundamental pharmacological and physiological principles of the effects of drugs on autonomic organs introduced in Foundation Course III.

VETMED 672 Antimicrobial Drug Therapy in Veterinary Medicine

Spring. 1 credit. Second-, third-, and fourth-year veterinary students. Letter grades only. W. S. Schwark.

The objective of this course is to familiarize students with antimicrobial drugs used in veterinary practice. The course will build on fundamental pharmacological and microbiological principles covered in Foundation Courses III and IV and will consider antibacterial, antifungal, antiparasitic, and anticancer drugs from the point of view of unique pharmacokinetic properties, indications for clinical use, and potential toxicities as the basis for rational use.

VETMED 673 Growth Factor-Coupled Signal Transduction

Spring, even-numbered years. 0.5 credit. First-, second-, third- and fourth-year veterinary students and permission of instructor. Letter grades only. R. A. Cerione.

This course will present basic information regarding the regulation of cell growth and differentiation. The emphasis will be on the signal transduction pathways that are responsible for translating growth factor binding at the cell surface into nuclear responses and mitogenesis. The course should complement cases covered in Foundation Course II and tie together the biochemical pathways underlying cell growth with biological processes such as wound healing and disease states such as cancer.

VETMED 674 Physiology and Pharmacology in the Understanding and Treatment of Diabetes

Spring, odd-numbered years. 1 credit. Maximum enrollment 24. S-U grades only. G. Sharp.

This course will cover the basic causes of the manifestations of diabetes, signal transduction mechanisms controlling insulin secretion and insulin action, and the principles underlying current and potential future treatment for this group of diseases. The course will stress the value of basic research into cellular and molecular mechanisms for the treatment and cure of disease.

[VETMED 675 Fundamental Principles of Vertebrate Central Nervous System Pharmacology]

Spring. 0.5 credit. Minimum enrollment 6. Second-, third-, and fourth-year veterinary students. Letter grades only. Not offered 2000-2001. Next offered spring 2002. L. M. Nowak.

This course will include up-to-date knowledge of physiological and pharmacological aspects of the main central nervous system neu-

rotransmitter receptors and provide a basis for rational understanding of the drugs used during surgery and in treatment of neurological diseases.]

VETMED 676 Clinical Ophthalmology

Spring. 0.5 credit. Third- and fourth-year veterinary students. S-U grades only. R. Riis, N. Irby, and T. Kern.

The principles and practice of entry-level veterinary ophthalmology introduced in Block V, Introduction to Veterinary Ophthalmology, are supplemented by lectures and discussions that emphasize species differences, basic surgical decision-making, and recognition of ocular conditions appropriate for referral.

VETMED 677 Dairy Production Medicine

Fall. 2 credits. Minimum enrollment 6; maximum enrollment 14. Third- and fourth-year veterinary students. S-U grades only. C. Guard.

This is an intermediate course in the techniques and procedures used by veterinarians in modern dairy practice. Many of these activities fall outside the traditional boundaries of medicine, surgery, and theriogenology and might include housing, facilities, manure management, and employee education. Data analysis, disease and productivity monitoring, and evaluation of deviations from targeted performance are used to plan cost-effective interventions or corrections, followed by continued surveillance to monitor their effect. Students will be introduced to the dominant software currently used in dairy management. Local dairy herds will serve as additional laboratories for class projects.

[VETMED 678 Small Animal Theriogenology]

Spring. 1 credit. Third- and fourth-year veterinary students. Letter grades only. Not offered 2000-2001. R. Gilbert.

This is a distribution course in a lecture-based format designed to complement the knowledge gained in the theriogenology component of Foundation Course V, Animal Health and Disease. Content includes discussion of breeding management, infectious and noninfectious causes of infertility and pathology of the male and female reproductive tracts, their diagnosis and management. The emphasis of the course will be on conditions affecting dogs and cats, but some conditions of other common pet species will be discussed.]

VETMED 679 Clinical Pharmacology

Spring. 0.5 credit. Third- and fourth-year veterinary students. S-U grades only. W. Schwark.

This course is offered after Blocks I-V and formal exposure to pharmacology course work is completed. The course is designed to familiarize students with drug use in the clinical setting and uses ongoing cases in the teaching hospital as a teaching tool. Pharmacological concepts are emphasized, with a focus on the rationale for drug choice, alternative drug choices available, pharmacokinetic considerations, and potential drug interactions/toxicities. This course is offered at the time students are about to embark on their clinical rotations. It is designed to emphasize practical aspects of pharmacology in the clinical setting, using basic concepts obtained during formal course work. The onus will be placed on the student to explain/rationalize drugs employed in clinical cases in the teaching hospital.

VETMED 680 Behavior Problems of Horses

Spring. 1 credit. Prerequisite: one semester of veterinary curriculum. First-, second-, third-, and fourth-year veterinary students. S-U grades only. K. A. Houpt.

The goal of this course is to give veterinary students the ability to treat the behavior problems of horses. History-taking, counseling, diagnostic tests, follow-up, the importance of cooperation with the referring veterinarian, prevention of behavior problems, training techniques of value to the practitioner, and socialization of foals will be presented.

VETMED 681 Behavior Problems of Small Animals

Spring. 1 credit. Prerequisite: one semester of veterinary curriculum. First-, second-, third-, and fourth-year veterinary students. S-U grades only. K. A. Houpt.

The goal of this course is to give veterinary students the ability to treat the behavior problems of cats and dogs. History-taking, counseling, and follow-up methods will be presented. Each student will have the opportunity to participate in three cases. Behavioral and pharmacological treatments for behavior problems will be presented.

VETMED 682 Topics in Veterinary Emergency and Critical Care Medicine

Spring. 1 credit. Minimum enrollment 10; maximum enrollment 35. Enrollment is done by lottery. Third- and fourth-year veterinary students; all others by permission of instructor. S-U grades optional. P. Moon.

This course will provide an introduction to emergency and critical care medicine. It is designed to have one to two topics per week. An introductory seminar will present basic information on the topic(s) at the beginning of the week followed by a two-hour group discussion later in the week. Although most of the cases will be based on small-animal cases, the same principles will apply to both large- and small-animal situations. Topics that might be covered include: triage, emergency fluid therapy, cardiac and pulmonary emergencies, nutritional support, common toxicology problems, emergency surgical procedures (chest tubes, tracheotomies), and basic and advanced cardiopulmonary resuscitation. When two courses (i.e., section "A" and "B") are offered in the same year, different topics will be covered in each course.

[VETMED 684 Thermoregulation and Exercise]

Fall. 1 credit. Second-, third-, and fourth-year veterinary students. Letter grades only. Offered odd numbered years. Next offered 2001-2002. D. Robertshaw.

An examination of the competing demands on the body of exercise and heat exposure with particular emphasis on the cardiopulmonary systems and integration of thermoregulatory reflexes.]

VETMED 685 Physiology of Pregnancy

Spring. 2 credits. Maximum enrollment 20. Second-, third-, and fourth-year veterinary students. Letter grades only. P. W. Nathanielsz.

This course is presented in lecture fashion. One major reference per lecture will be assigned each week. Subjects covered are placental function, fetal growth, central nervous system development, fetal breathing,

biorhythms in maternal and fetal physiology, parturition, and adaptations to newborn life.

VETMED 689 Fundamentals of Ruminant Digestion and Metabolism

Spring. 0.5 credit. Minimum enrollment 5; maximum enrollment 50. First-, second-, third-, and fourth-year veterinary students; selected graduate students by permission of instructor. Letter grades only.

T. R. Houpt.

This course is designed for the student who has little or no previous course work in ruminant digestive physiology. It will consist primarily of lectures surveying the functional aspects of control of feed intake; salivation; reticuloruminant motility, including rumination and eructation; microbial flora and fauna; fermentation in reticulorumen (digestion of carbohydrates, proteins and fats); ruminal gas formation; absorption of short-chained fatty acids; special features of ruminal nitrogen metabolism; passage of nutrients to lower tract; and a brief consideration of the functions of omasum, abomasum, and small and large intestines. Emphasis will be on the differences of the ruminant digestive processes from those of the simple-stomached animals.

[VETMED 690 Molecular and Genetic Basis of Inherited Disorders in Animals and Application to Clinical Medicine]

Spring. 2 credits. Minimum enrollment 5; maximum enrollment 15. First-, second-, third-, and fourth-year veterinary students; graduate and undergraduate students also welcome. Letter grades only. Offered even-numbered years. J. Ray.

This course introduces the molecular basis of inherited diseases in domestic animals. Topics include several inherited metabolic defects causing systematic malfunctions; muscle and bone abnormalities; retinal degeneration; and failure of the immune systems. Techniques to characterize genes and mutations. Use of molecular techniques for diagnosis and prevention. Use of molecular tools for the treatment of inherited disorders.]

[VETMED 692 Current Concepts in Reproductive Biology]

Fall. 3 credits. First-, second-, and third-year veterinary students or appropriate undergraduate/graduate training. Letter grades only. Lec, 2 hours each week; disc, 2 hours each week; T R 10:10-12:05. Offered odd-numbered years. Next offered fall 2001. J. Fortune, W. R. Butler, and staff.

This is a team-taught survey course in reproductive physiology/endocrinology. Lectures are given by several reproductive biologists on various aspects of male reproductive function (endocrine regulation, testis function, spermatogenesis, and sperm physiology/function); female reproductive function (endocrinology, ovarian development and function, oocyte physiology/function); pregnancy; parturition; puberty; and reproductive technology. Students participate in the form of discussions and/or presentations.]

VETMED 695 Genetic Basis of Eye Diseases

Spring. 1 credit. Minimum enrollment 5; maximum enrollment 14. First-, second-, third-, and fourth-year veterinary students. Letter grades only. G. Aguirre.

This course covers the molecular and genetic basis of inherited eye diseases in domestic and laboratory animals. It is aimed at the

professional student in the veterinary curriculum but is open to graduate-level students. The course will be given in a combination lecture/seminar format, with students leading and actively participating in discussions. The students are expected to do assigned and independent outside research, both for class discussions and the paper.

VETMED 696 Fundamental Principles and Techniques of Small Animal Anesthesia: Dogs, Cats, and Birds.

Spring. 1 credit. Minimum enrollment 15. Third- and fourth-year veterinary medical students. P. F. Moon, R. D. Gleed, and J. W. Ludders.

This course is designed for the veterinary medical student interested in small-animal practice. The course will consist of lectures, case discussions, and development of anesthetic protocols for routine and complicated cases. Subjects to be covered include anesthetic management for elective and emergency surgery, management of the high-risk patient, fluid therapy, drug interactions, pain management, and the management of anesthesia-related complications, cardiopulmonary resuscitation, and post-anesthetic management. While fundamental concepts and recent advances in anesthesia will be discussed, the practical application of anesthetic principles and techniques will be a major objective of the course.

VETMED 697 Fundamental Principles of Large Animal Anesthesia: Equine and Mixed Animal Practice

Spring. 1 credit. Minimum enrollment 15. Third- and fourth-year veterinary medical students. J. W. Ludders, R. D. Gleed, and P. F. Moon.

This course is designed for the veterinary medical student interested in equine or mixed animal practice. The course will consist of lectures, case discussions, and development of anesthetic protocols for routine and complicated cases. Subjects to be covered include anesthetic management for elective surgery, field anesthesia, management of the high-risk patient, fluid therapy, drug interactions, pain management, and the management of anesthesia-related complications, cardiopulmonary resuscitation, and post-anesthetic management. While fundamental concepts and recent advances in anesthesia will be discussed, the practical application of anesthetic principles and techniques will be a major objective of the course.

VETMED 698 Special Projects in Veterinary Medicine

Fall, winter, spring, summer. Variable 1-4 credits. Must be arranged with a College of Veterinary Medicine tenure-track faculty member. S-U grades optional.

This course provides the opportunity for students to work individually with a faculty member to pursue an area of particular interest and, typically, not part of the established curriculum. Specific course objectives and course content are flexible and reflect the scope and academic expertise of the faculty.

VETMED 699 Research Opportunities in Veterinary Medicine

Fall, winter, spring, summer. Variable 1-4 credits. Must be arranged with a College of Veterinary Medicine tenure-track faculty member. S-U grades optional.

This course provides the opportunity for individual students to work in the research

environment of faculty involved in veterinary or biomedical research. Specific course objectives and course content are flexible and reflect the specific research environment. Research projects may be arranged to accumulate credit toward requirements in Distribution Sets I, II, III, IV, and V.

VETMED 700 Large Animal Theriogenology Service

Spring. 2 or 4 credits. Prerequisite of VETMED 551. Maximum enrollment 6 per rotation. Third- and fourth-year veterinary students. Letter grades only.

D. H. Volkman and staff.

This clinical service rotation is offered to provide additional hands-on experience in all phases of theriogenology. Equine reproductive management and medicine is stressed. Experience includes teasing, transrectal palpation, ultrasonography, semen collection, evaluation, extension and shipping, artificial insemination, and management of natural breeding. Other techniques emphasized include taking and evaluating endometrial biopsy and cytology samples, as well as samples for culture. Both university-owned and client-owned animals provide the basis for these experiences. Experience in routine dairy reproductive management is provided in the college-owned dairy herd. In addition, client-owned animals admitted to the Cornell University Hospital for Animals with reproductive disorders are managed by this service.

VETMED 701 Cardiology Service

Fall and spring. 2 credits. Prerequisite VETMED 551. Minimum enrollment 1 per rotation; maximum enrollment 2. Third- and fourth-year veterinary students. Letter grades only. S. Moise.

The purpose of the cardiology rotation is to provide the student with the opportunity to put into practice what they have learned in the foundation years. The management of the most common cardiac diseases will be emphasized including congestive heart failure, arrhythmias, and secondary cardiac diseases. All species will be examined, large and small, although the majority will be small animals. Diagnostics, including cardiovascular physical examination, electrocardiography, radiography, and echocardiography, will be taught. The rotation includes clinical work, didactic teaching, and self-initiated digging for information.

VETMED 702 Laboratory Animal Medicine

Fall and spring. 2 credits. Prerequisite of VETMED 551. Maximum enrollment 4 per rotation. Third- and fourth-year veterinary students. Letter grades only. F. Quimby and staff.

The practice of laboratory animal medicine requires a combination of preventive programs, clinical skills, knowledge of various species' biologies, familiarity with research methodology, and acquaintance with state and federal regulations. This course is offered as a two-week introduction to that specialty. Students accompany laboratory animal veterinarians on clinical rounds of Cornell's research animal housing and participate in laboratory diagnostic work. Review sessions are conducted on the biology, medicine, pathology, and husbandry of rodents, rabbits, and primates and on current legislation regulating the care and use of research animals. The course may include a field trip to the research animal facilities of Rockefeller University, the Cornell University Medical

College, Marshall Farms, and the Laboratory of Experimental Medicine and Surgery in Primates.

VETMED 703 Clinical Wildlife, Exotic, and Zoo Animal Medicine

Fall, winter, spring, summer. 2 credits. Prerequisite: VETMED 551. Maximum enrollment 2 per rotation. Third- and fourth-year veterinary students. Letter grades only. N. Abou-Madi and staff.

This course introduces students to primary medical care of nontraditional pet species, zoo animals, and native wildlife. Students, directly supervised by the attending clinician, are responsible for the assessment, physical examination, and medical management of exotic animal species presented to the Cornell University Hospital for Animals. Other opportunities available to assist in the development of clinical skills in wildlife, zoo and exotic animal medicine include the wildlife clinic cases, ongoing wildlife research and service projects, and trips to the Burnett Park Zoo. Successful completion of the course requires satisfactory performance during this 14-day clinical rotation.

VETMED 704 Quality Milk

Fall or spring. 2 credits. Prerequisite: VETMED 551. Third- and fourth-year veterinary students. Letter grades only. R. Gonzalez, Y. Schukken, D. Wilson and staff.

This course covers the causes, diagnosis, treatment, and prevention of bovine mastitis. The role of management practices is stressed. The course includes lectures, readings, discussions, laboratory exercises, and farm visits as part of the Quality Milk Promotion Services—New York State Mastitis Control Program. Participants are expected to complete a case study on a dairy farm with udder health problems and present their findings to the producer and farm personnel. Grading is on performance during the course and a final exam.

VETMED 705 Special Opportunities in Clinical Veterinary Medicine

Fall, spring, and summer. Prerequisite: VETMED 551. Third- and fourth-year veterinary students. S-U grades only.

This course provides opportunities for students finished with Foundation Course V to explore professional areas not available through the regular curriculum. Blocks of two to four weeks are usually spent at other teaching hospitals, research laboratories, or zoological facilities. Student proposals are submitted to the associate dean for academic programs for review and approval. On-site supervisors of the block act as ex-officio faculty members and are required to evaluate each student formally.

VETMED 707 Poultry Medicine and Production Rotation

Fall. 2 credits. Prerequisite: VETMED 551 and VETMED 616, Diseases of Birds, is recommended. Third- and fourth-year veterinary students. K. A. Schat.

This course is a two-week rotation that will take place at the University of St. Hyacinthe or the University of Guelph in alternating years. The course provides students with an introduction in practical poultry medicine by a combination of lectures, discussions, and laboratory sessions including postmortem examinations. Students will also visit hatcheries, broiler, layer, and turkey farms.

VETMED 708 Clinical Oncology

Fall and spring. 2 credits. Prerequisite of VETMED 551. Maximum enrollment 4 per rotation. Third- and fourth-year veterinary students. Letter grades only. R. Page.

Management and prevention of cancer in companion animals represents a significant component of the practice of veterinary medicine. The focus of this clinical rotation will be the development of a comprehensive set of skills necessary for a veterinarian to become an advocate for the client/patient with cancer. These skills will include appropriate initial evaluation of animals with cancer, sensitive and effective client and referring veterinarian communication, ability to access relevant information from numerous sources related to cancer management, understand and apply principles of surgical, medical, and radiation oncology as well as techniques specifically related to minimize pain and treatment-related effects in cancer patients.

VETMED 720 Issues and Preventive Medicine in Animal Shelters

Spring. 1 credit. Prerequisite: VETMED 540. Minimum enrollment 5; maximum enrollment 30. Second-, third-, and fourth-year veterinary students. Letter grades only. J. M. Scarlett and staff from the American Society for Prevention of Cruelty to Animals.

Veterinarians often work for or with animal shelters, serve on shelter boards of directors, are community resources for issues relating to companion animal welfare, participate in spay and neuter programs, and influence the quality of the human-animal bond. This course will address the history of the humane movement, role of the veterinarian in relation to shelters, preventive and palliative health management (including highlighting diseases of major concern), issues surrounding euthanasia, reasons for relinquishment, programs for behavior modification, and the legal concerns of shelters. These issues will be addressed using lectures and large group discussions.

VETMED 721 Timely Topics in Veterinary Parasitology: Large Animal

Spring. 0.50 credits. Minimum enrollment 2. Third-, and fourth-year veterinary students. S-U grades only. D. D. Bowman.

This course will present an in-depth look at one or a few parasites of special interest relative to large-animal medicine. The course will present details of taxonomy, biology, epidemiology, clinical presentation, and preventive and curative treatment. Efforts will be made to discuss those aspects of the disease as it relates to the practical control of these and in-depth coverage of primary literature relating to the parasite being discussed. Topics will vary annually. The course will be presented in a lecture/discussion format.

VETMED 722 Timely Topics in Veterinary Parasitology: Small Animal

Spring. 0.5 credits. Minimum enrollment 2. Third- and fourth-year veterinary students. S-U grades only. D. D. Bowman.

This course will present an in-depth look at one or a few parasites of special interest relative to small-animal medicine. The course will present details of taxonomy, biology, epidemiology, clinical presentation, and preventive and curative treatment. Efforts will be made to discuss those aspects of the

disease as it relates to the practical control of these and in-depth coverage of primary literature relating to the parasite being discussed. Topics will vary annually. The course will be presented in a lecture/discussion format.

VETMED 723 Bacteria and Fungi in Veterinary Medicine

Spring. 2 credits. Minimum enrollment 8; maximum enrollment 80. Second-, third-, and fourth-year veterinary students. Letter grades only. D. P. Debbie.

This course will provide an overview and listing of important bacterial and fungal diseases of domestic animals (cow, horse, sheep, pig, goat, dog, cat) in preparation for medicine courses. The etiology, pathogenesis, host response, and prevention will be emphasized. Avian, zoonotic, and exotic (foreign animal) bacterial and fungal diseases will be covered in less detail because they are covered in other courses. The course will also provide insight into diagnostic procedures for bacterial and fungal diseases such as available tests, what samples to take, how to handle samples, and how diagnostic procedures are performed.

[VETMED 725 Diagnostic Cytology

Spring. 1 credit. Prerequisite: VETMED 628. Maximum enrollment 5. Second-, third-, and fourth-year veterinary students. S-U grades only. Not offered 2000–2001.

This two-week course will provide in-depth experience in preparation and interpretation of cytological specimens. Evaluation of the cytological specimens will be incorporated into clinical cases, so that the results are interpreted with respect to the provided case material. The primary mode of instruction is based on faculty-driven microscopic slide evaluation. Students will be required to evaluate the slides independently before the microscope sessions. Selected mini-tutorials and laboratories will complement the microscopic sessions. The course builds on concepts previously addressed in the Foundation Blocks 3 and 4 and in the Clinical Pathology Distribution Course (VETMED 628). This course is limited to students participating in or who have completed the Clinical Pathology Distribution Course.]

VETMED 726 Reptile Medicine and Surgery

Spring. 1 credit. Minimum enrollment 10; maximum enrollment 40. Third-, and fourth-year veterinary students. Letter grades only. N. Abou-Madi.

This course is designed to introduce third- and potentially fourth-year veterinary students to the principles and practices of reptile medicine and surgery. The course will be taught in a basic lecture and discussion format with laboratories (limited) reinforcing concepts presented in the lectures.

[VETMED 730 Vaccines: Theory and Practice

Spring. 1 credit. Prerequisite: introductory course in immunology or VETMED 540 or VETMI 315. Minimum enrollment 10; maximum enrollment 40. Second-, third-, and fourth-year veterinary students and graduate students; others by permission of instructor. Letter grades only. Grades based on two examinations. Offered even-numbered years. T. Clark.

This course will provide an overview of vaccines used in clinical practice, as well as an in-depth look at vaccine development.

Emphasis will be placed on the most recent advances in vaccine design and delivery, including the use of recombinant DNA techniques for targeting specific immunological responses. Lectures will touch on vaccines commonly used in veterinary practice and will address in detail the use of carriers, adjuvants and immunostimulants; attenuated pathogens; synthetic peptides; recombinant subunit vaccines; viral and bacterial vectors for vaccine delivery; synthetic antibodies; and genetic immunization with "naked" DNA.]

VETMED 732 Veterinary Clinical Toxicology

Spring. 1.5 credits. Second-, third-, and fourth-year veterinary students. S-U grades optional. L. Thompson and K. Earnest-Koons.

This course will provide the veterinary student with a solid introduction to concepts and principles of toxicology and how they are applied in the clinical setting. Students will learn about specific common toxicants, clinical signs in affected animals, and treatment protocols for the toxicants in question. Students will also gain an understanding of the clinical approach to suspected or unknown toxicoses, sample collection and handling, and resources available for clinical toxicologic problems. The course will be conducted with two 1-hour lectures per week and one hour-long large-group discussion per week. The class will meet two days per week, the first day for one hour and the second day for two hours. Grades will be based on weekly quizzes, a final exam, a short paper and/or oral participation.

VETMED 733 Selected Infectious Diseases of Swine

Spring. 1.5 credits. Minimum enrollment 6; maximum enrollment 80. Second-, third-, and fourth-year veterinary students. S-U grades optional. K. Earnest-Koons.

This course will provide veterinary students with a solid introduction to concepts and principles of swine infectious diseases and how they are treated in the clinical setting. Students will learn about specific infectious diseases, clinical signs in affected animals, and treatment protocols for the diseases in question. Students will also gain an understanding of the clinical approach to suspected or unknown infectious agents, sample collection and handling, and resources available for infectious disease diagnosis. The course will be conducted with two 1-hour lectures per week and one hour-long large-group discussion per week. The class will meet three days per week for one hour each. Grades will be based on weekly quizzes, a final exam, a short paper and/or oral participation.

VETMED 735 Special Topics in Ambulatory and Production Animal Medicine.

Fall, winter, spring, and summer. Variable 1-2 credits. Prerequisite: VETMED 560. Enrollment is done by lottery. Second-, third-, and fourth-year veterinary students. Letter grades only. M. E. White and Staff.

This course provides specialized experiences in the Ambulatory and Production Medicine Service. The course will consist of participation in scheduled and emergency farm calls and completion of projects designed to provide experience in herd problem solving, records analysis and implementing herd-health programs. Clinical service assignments will be planned to meet individual student goals.

Examples of focus areas available include livestock production medicine, dairy reproductive examinations, small-ruminant medicine, and equine ambulatory practice.

VETMED 736 Veterinary Diagnostic Imaging: Anatomy and Interpretation

Spring. 1.5 credits. Minimum enrollment 20; maximum enrollment 50. First- and second-year veterinary students by permission of instructor. Third- and fourth-year veterinary students. Letter grades only. P. Scrivani.

The course is designed to emphasize the relevance of a solid foundation in veterinary anatomy as it clinically applies to diagnostic imaging. Additionally, the course is designed to provide students with an understanding of the strengths and limitation of diagnostic imaging by discussing interpretation principles, pitfalls and interpretations, and measurements obtained through lectures, laboratory exercises, weekly quizzes, and reading assignments. Integration of these objectives will culminate in weekly laboratory exercises where students must make or evaluate decisions regarding patient management based on evaluation of clinical signs and imaging examinations. The "Roentgen-Sign" approach to diagnostic imaging interpretation will be used as a model.

VETMED 737 Principles of Pathology

Spring. 1.5 credits. Minimum enrollment 6; maximum enrollment 40. Second-, third-, and fourth-year veterinary students. Letter grades only. S. McDonough and K. Earnest-Koons.

Principles of Pathology is intended for students who wish to strengthen and broaden their knowledge of the pathologic basis of disease. Fundamental biologic processes as revealed by gross and microscopic pathologic changes will be emphasized. Molecular mechanisms will be integrated into the discussion where appropriate. General pathologic processes will be organized into a logical and uniform system in order to facilitate comprehension and learning with particular attention paid to definition and proper usage of terminology. The course will include two lectures per week and a one-hour large-group discussion. The large-group discussion will allow students to apply general knowledge gained in lecture to a specific problem. Approximately half of the large-group discussions will be held in the Necropsy Teaching Laboratory using actual diseased organs for illustration of general pathologic principles.

VETMED 738 Veterinary Parasitology

Spring. 2.5 credits. First-, second-, third-, and fourth-year veterinary students. Letter grades only. D. D. Bowman

This course provides a basic introduction to small-animal parasites of veterinary importance, concentrating mainly on the biology, control, and diagnosis of protozoan and metazoan parasites. Emphasis will be given to parasites representative of significant disease processes or of significant clinical importance to veterinarians and pet owners. The course will elaborate on the biology and pathogenesis of these major pathogens with the ultimate goal being to maximize the recognition of the major disease manifestations induced through examples of each of the different groups of organisms.

VETMED 739 Viruses in Veterinary Medicine

Spring. 1.5 credits. Maximum enrollment 90. Second-, third-, and fourth-year veterinary students. Letter grades only. C. Parrish and J. Baines.

This course is designed to supplement the information provided in the Foundation Courses, particularly courses IV and V. The objective would be to provide, in a survey form, an overview of the major groups of viruses, which infect animals, and to give a summary of the diseases that they cause. The diseases, which are most commonly encountered in veterinary practice, would be given the greatest amount of the available time, and diseases which are less frequently seen would be given less detailed coverage. It is not a major objective of the course to teach students

differential diagnosis or treatment of disease, as that information is more appropriately covered in Foundation Courses V and VI. However, knowledge of the agents and diseases that are described in this course will be useful background for the other courses.

VETMED 745 Dynamics of Dairy Herd Health and Management

Spring. 1 credit. First-, second-, third-, and fourth-year veterinary students. Letter grades only. Y. T. Grohn and L. D. Warnick.

Competitive pressure, increasing input costs, and comparatively stagnant milk and salvage values require dairy producers to become more efficient. The current trend of increasing herd size drives changes in management. Dairy cattle are handled in groups, although individual cow health and productivity fundamentally underpin the financial success of the dairy enterprise. Veterinarians are called upon to advise dairy producers not only in matters of herd health but increasingly in matters of productivity and management decision making. Identifying opportunity areas to improve productivity and ultimately profitability requires modern veterinarians to recognize and solve complex and interdependent milk production, reproduction, and health issues. Until the advent of the new veterinary curriculum, biological systems were often taught in isolation. Yet there are research models that integrate the dynamic nature of dairy production, health, management, and economics through epidemiological and economic modeling. Despite the existence of such advanced research models, they have not been integrated fully into the curriculum. The goal of this course is to teach students the dynamic relationships of herd performance parameters with dairy herd health and management. This will be done with a combination of lectures and exercises using two computer simulation models. The following topics will be addressed: (1) how often production diseases occur and when, (2) how they are interrelated, (3) the impact of disease on milk production, reproductive performance, and risk of culling, and (4) how to use this information in production medicine.

The format of this eight-week course (two days per week) is a lecture one day and hands-on work with computer simulation models on the other day.

Biomedical Sciences

VETBMS 346 Introductory Animal Physiology (enroll in VETPH 346) (also BIOAP 311) (Undergraduate)

Fall. 3 credits. Prerequisites: BIOG 105, BIOG 106, or BIOG 101, BIOG 102, BIOG 103, BIOG 104, BIOG 107, BIOG 108; CHEM 207, CHEM 208, or CHEM 206, or CHEM 215, CHEM 216; MATH 106, MATH 111 or MATH 191 or AP credit for any of the above; or one year of college-level biology, chemistry, and mathematics. S-U grades optional. M W F 11:15. E. R. Loew. A general course in animal physiology emphasizing principles of operation, regulation, and integration common to a broad range of living systems from the cellular to the organismal level. Structure-function relationships are stressed along with underlying physical-chemical mechanisms.

VETBMS 600 Special Projects in Anatomy (enroll in VETA 600)

Fall, spring. 1 credit per 2.5-hour period. By permission of instructor. S-U grades only. Biomedical science staff.

VETBMS 628 Graduate Research in Animal Physiology (Graduate) (enroll in VETPH 628) (also BIO S 719)

Fall, spring. 1-3 credits. By written permission of department chairperson and faculty mentor who will supervise the work and assign the grade. S-U grades optional.

Similar to Biological Sciences 499 but intended for graduate students who are working with faculty members on an individual basis.

VETBMS 639 Autotutorial in Laboratory Animal Medicine and Science (enroll in VETPA 639)

Spring. 1-3 credits. Letter grades only. F. W. Quimby.

This course is offered to individuals interested in pursuing various aspects of laboratory animal medicine and science in depth. A variety of resources are available to assist students in their research on a particular topic: the library of the Division of Laboratory Animal Medicine, including the autotutorial library; the university libraries; and special information collected from other institutions. Grades are determined on the basis of a paper, an oral presentation, or the creation of an audiovisual teaching aid, any of which may be selected by the student.

VETBMS 700 Predictions of Form or Phylogeny (enroll in VETA 700)

Spring. 1 credit. By permission of instructor. S-U grades optional. J. W. Hermanson.

Form and function are often discussed as a correlated entity in biology. This seminar group will start with the question, Does form really predict function? This will be addressed initially with respect to the analysis of paleobiology but will then encompass examples of experimental functional morphology. In particular, there is a growing body of experimental data demonstrating that diverse functions can be achieved with nearly identical morphologies, and that the functional diversity may better be explained by behavior or environmental factors. Might these observations refute current theories about the origin of flight in extinct organisms (i.e., the cursorial or ground-up theory of flight versus the arboreal gliding theory of flight evolution)? Specific topics pursued will be selected by participants in this course. Participation will be

open to interested graduate students, advanced undergraduate students, and veterinary students.

VETBMS 713 Cell Cycle and Growth Regulation (enroll in VETPA 713)

Spring. 1 credit. S-U grades only. A. Yen. Current topics in the control of mammalian cell division will be discussed, including growth factors and oncogenes.

VETBMS 720 Special Problems in Physiology (Graduate) (enroll in VETPH 720)

Fall, spring. 1-3 credits. By permission of instructor. Laboratory work, conferences, collateral readings, and reports. Adapted to the needs of students. S-U grades optional.

VETBMS 788 Seminar in Surgical Pathology

Fall, spring. 1 credit. Intended for residents; third- and fourth-year veterinary students may attend. Letter grades only. B. A. Summers and staff.

The major objective of this discussion and seminar course is to introduce the residents to the discipline of surgical pathology. Selected material from the Surgical Pathology Service is prepared in advance for independent review by the residents. The material is presented in a slide-seminar format by the residents under the review of the faculty. Emphasis is placed on pathogenesis, etiology, and pathologic descriptions of the lesions. In addition, appropriate guest lecturers cover specific areas of interest and special topics not encountered in the departmental service programs.

VETBMS 796 Medical Primatology (enroll in VETPA 796)

Fall. 1 credit. For residents and graduate students by permission of instructor. Offered even-numbered years. F. W. Quimby.

This course is a survey of major diseases, medical care, and management techniques for all life stages of primates. Topics include physical examination, restraint anesthesia, housing, and management of various nonhuman primate species; bacterial, viral, and parasitic diseases; noninfectious diseases; infant and nursery care reproduction and behavioral considerations; and therapeutics.

VETBMS 811 Advanced Physiology Methods I (enroll in VETPH 811) (also BIO S 811) (Graduate)

Fall. 2 credits. Enrollment limited. Prerequisite: graduate student status or permission of course coordinator. S-U grades only. Lab TBA. J. Ray.

This is a course primarily for graduate students in physiology and related disciplines. Experiments are carried out in the laboratories of physiology faculty members to acquaint students with the latest techniques and methods in physiological research. Three modules are offered each semester by arrangement with the course coordinator.

VETBMS 812 Advanced Physiology Methods II (enroll in VETPH 812) (also BIO S 812) (Graduate)

Spring. 2 credits. Enrollment limited. Prerequisite: graduate student status or permission of course coordinator. S-U grades only. Lab TBA. J. Ray.

This is a course primarily for graduate students in physiology and related disciplines. Experiments are carried out in the laboratories of physiology faculty members to acquaint students with the latest techniques and

methods in physiological research. Three modules are offered each semester by arrangement with the course coordinator.

Clinical Sciences

[VETCS 700 Pathophysiology of Gastrointestinal Surgery]

Fall. 1.5 credits. S-U grades only. Offered every third year. Next offered fall 2001. N. G. Ducharme.

Normal anatomy and physiology of the gastrointestinal system in carnivores, herbivores and ruminants will be presented initially. This will be followed by in-depth discussion of the pathophysiological mechanisms and sequelae of gastrointestinal obstructions including reperfusion injury, peritonitis, adhesions and short bowel syndrome. The emphasis of this course is development of advanced understanding of surgically relevant gastrointestinal problems that lead to appropriate decision making.]

[VETCS 701 Pathophysiology of Orthopedic Surgery (Graduate)]

Spring 1.5 credits. Prerequisites include DVM, MD, or equivalents or approval of instructor. S-U grades only. Offered every third year. Next offered spring 2002. E. J. Trotter.]

[VETCS 702 Pathophysiology of Cardiopulmonary Surgery (Graduate)]

Fall. 1.5 credits. Prerequisite: DVM degree or equivalent. S-U grades only. Offered every third year. Next offered fall 2002. R. P. Hackett, S. L. Fubini, N. G. Ducharme, H. J. Harvey.

Using lectures and group discussions, the objective of this course is to explain the pathophysiology of various cardiovascular diseases (cardiac arrest, cardiac arrhythmia under anesthesia) and airway disease (thoracic and upper airway disease). As a basis for these abnormalities, cardiopulmonary hemodynamics and biomechanical aspects of ventilation will be reviewed. The emphasis is placed on understanding these mechanisms and outlining the surgeon's response to them.]

[VETCS 703 Surgical Principles and Surgery of the Integumentary System (Graduate)]

Spring. 1.5 credits. For graduate DVMs (or equivalent) in residency or graduate training programs. S-U grades only. Offered every third year. Next offered spring 2003.

This course is designed for surgery residents and graduate students. It is largely discussion format and examines surgical principles and surgery of the integumentary system.]

[VETCS 704 Pathophysiology of Urogenital Surgery (Graduate)]

Fall. For graduate DVMs or equivalent in residency or graduate training programs. 1.5 credits. S-U grades only. Offered every third year. Next offered fall 2001. S. Fubini.

This course is designed to review and discuss urogenital surgical procedures in animals and the rational basis for them. Pathophysiology will be stressed. Some classes will consist of reprints with discussion.]

VETCS 705 Animal Pain and Its Control

Spring. 2 credits. By permission of instructor. S-U grades optional. R. D. Gleed, J. W. Ludders, and P. F. Moon.

This course is open to third- and fourth-year veterinary medical students, interns, residents, graduate students, and postdoctoral associates

who are interested in the fundamental and applied concepts of pain in animals. The course will emphasize the physiologic and pathophysiologic mechanisms involved in pain perception by animals, their responses (physiological and behavioral) to pain, and the pharmacologic mechanisms underlying analgesic therapy. The subject material will be presented through lectures, group discussions, and group evaluation of analgesic protocols.

VETCS 706 Pathophysiology of Neurologic Surgery (Graduate)

Spring. 1.5 credits. Prerequisite: DVM, MD, or equivalent or approval of instructor. S-U grades only. Offered every third year.

This course provides specialized training in neurosurgical techniques and application and discusses pathophysiologic implications of neurosurgical and neurologic diseases.

VETCS 710 Advanced Veterinary Anesthesiology I

Fall, winter. 1 credit. Prerequisite: VETMED 568 Veterinary Anesthesiology or permission of instructor. Third- and fourth-year veterinary students, graduate students, interns, and residents. S-U grades only. P. F. Moon and staff.

The content of this course is designed for preparation for the American College of Veterinary Anesthesiology examinations. However, the course is also suitable for interns and for residency training in other areas such as surgery and internal medicine. Speakers will be from both inside and outside the college. Topics will cover the basic sciences as they apply to anesthesiology such as physics and engineering, applied pharmacology, physiology, and pathology. Clinically oriented lectures will also be given concerning specific anesthetic techniques and species-specific differences in response to anesthetic drugs.

VETCS 711 Advanced Veterinary Anesthesiology II

Fall, winter, spring. 1 credit. Prerequisite: VETMED 568, Veterinary Anesthesiology or permission of instructor. Third- and fourth-year veterinary students, graduate students, interns, and residents. S-U grades only. P. F. Moon and staff.

The content of the course is designed for preparation for the American College of Veterinary Anesthesiology examinations. However, the course is also suitable for interns and for residency training in other areas such as surgery and internal medicine. Speakers will be from both inside and outside the college. Topics will cover the basic sciences as they apply to anesthesiology such as physics and engineering, applied pharmacology, physiology and pathology. Clinically oriented lectures will also be given concerning specific anesthetic techniques and species-specific differences in response to anesthetic drugs.

Microbiology and Immunology

VETMI 315 Basic Immunology (Undergraduate) (also Biological Sciences 305)

Fall. 3 credits. Strongly recommended: basic courses in microbiology, genetics, and biochemistry. S-U grades optional. J. A. Marsh.

This course is a survey of immunology, with emphasis on the cellular and molecular bases of the immune response. More information is available at the biog305.courseinfo.org web site.

VETMI 320 Principles of Toxicology (Undergraduate) (also Biological Sciences 320 and Toxicology 320)

Spring. 3 credits. Prerequisites: one year each of introductory biology and chemistry, with lab; one semester of organic chemistry lecture or waiver by instructor. S-U grades optional. T R 1:25–2:40.

S. Penningroth, R. Dietert, and S. Bloom. This course is an introduction to the interdisciplinary science of toxicology, drawing on material from biology, chemistry, pharmacology, ecology, earth science, risk analysis, and policy studies. Basic principles of toxicological science are presented and illustrated by case examples, such as pesticide toxicity to wildlife reproduction and human health risk assessment at a Superfund hazardous chemical waste site. Chemical risk management is described as a sociopolitical process involving the integration of scientific, economic, and cultural factors.

Independent student projects include a toxic chemical profile and a team analysis of hypothetical "environmental risk scenarios." Periodic talks by toxicology faculty acquaint students with basic research in this interdisciplinary branch of biological science. This is an introductory-level course in toxicology. Format: lecture supplemented by case examples. One field trip to a hazardous chemical waste site. Appropriate for nonmajors seeking basic literacy in environmental and human toxicology. "Gateway course" for students interested in 400- and 600-level toxicology courses.

VETMI 404 Pathogenic Bacteriology and Mycology (also BIOMI 404)

Spring. 2 or 3 credits (3 credits with lecture and seminar). Prerequisites: BIOMI 290 and 291. Seminar is required of graduate students and open to undergraduates with permission of instructor. Maximum enrollment 15 students. Letter grades only. Offered odd-numbered years. Microbiology faculty.

This is a course in medical microbiology, presenting the major groups of bacterial and mycotic pathogens important to human and veterinary medicine. The course emphasizes infection and disease pathogenesis. Topics include disease causality; interactions of host, pathogen, and environment, including immunity to bacteria and fungi; and principles of antimicrobial therapy and drug resistance. A companion seminar addresses the current and classic literature related to microbial pathophysiology on the cellular and molecular levels.]

VETMI 408 Viruses and Diseases I (also Biological Sciences 408)

Spring. 2 credits. Intended primarily for graduate and undergraduate microbiology majors. Prerequisites: Microbiology 290 and 291 (College of Agriculture and Life Sciences). Recommended: VETMI 315, Genetics 281. Letter grades only. Offered even-numbered years. J. W. Casey.

The course will cover basic concepts in virology with emphasis primarily on DNA virus-host interactions, strategies for gene regulation, and mechanisms of pathogenicity. Selected viral infections that result in immune dysfunction and neoplasia will be highlighted in the context of approaches to prevent or reduce the severity of diseases.

VETMI 409 Viruses and Disease II (also BIOMI 409)

Fall. 2 credits. Prerequisites: BIOMI 290 and 291 or permission of instructor. Recommended: BIOMI 408, BIOBM 330–332, BIOBM 432. Offered even-numbered years. G. Whittaker.

This course will be complementary to BIOMI 408, Viruses and Disease I, and will emphasize RNA viruses. The course will be complete in its own right. As such, completion of BIOMI 408 is not a requirement. The course will cover the structure and classification of viruses, entry, genome replication, and virus assembly. Particular emphasis will be placed on virus-host cell interactions. Vaccinations, chemotherapy and evolution of viruses will also be discussed.

[VETMI 420 Environment and Inflammation]

Fall. 1 credit. S-U grades optional. Prerequisite: VETMI 320. Not offered 2000–2001. R. Dietert.

The course will cover environmental factors (chemical and selected infectious agents) that represent important risk factors in host inflammatory reactions. Emphasis will be placed on environmental contaminants, dietary factors, and pharmacological agents that influence the potential for problematic inflammatory reactions in animals and humans. Additionally, the basic mechanisms of inflammation will be covered in the context of specific case studies. Chemicals and societally pervasive health challenges such as allergic diseases and autoimmunity will be introduced. In addition, health issues such as multiple chemical sensitivity (MCS), chronic fatigue syndrome (CFS), sick building syndrome (SBS), and Persian Gulf War illnesses will be discussed.]

VETMI 431 Medical Parasitology (Undergraduate)

Fall. 2 credits. Prerequisites: zoology or biology; any of the following courses: BIOES 261, 263, 264, 267, 274, 275, 278; BIOG 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 170, 202, 207; BIOMI 192, 290, 398 or equivalent course. Letter grades only. D. D. Bowman.

This course is a systematic study of arthropod, protozoan, and helminth parasites of public health importance, with emphasis on epidemiologic, clinical, and zoonotic aspects of these parasitisms.

VETMI 605 Special Projects in Microbiology (Undergraduate)

Fall, spring. 1–3 credits. By permission of instructor. Prerequisite: a good background in microbiology or immunology. Preferably, students should have background in pathogenic microbiology and immunology. S-U grades only. Microbiology staff.

The course normally provides an opportunity for the student to work in a research laboratory or carry out a special project under supervision.

[VETMI 700 The Biology of Animal Viruses (Graduate and Upper-level Undergraduate)]

Fall. 2 credits. Letter grades only. Offered odd-numbered years. C. R. Parrish and staff.

This course will examine current topics in studies of animal viruses, including some comparisons with plant viruses where similar mechanisms apply. Selected topics will be examined in depth, including the structures of viruses and their components, viral nucleic

acids and replication strategies, details of the interactions between viruses and their host cell components and metabolism. Other topics will include the evolution and selection of viruses, novel approaches to the prevention of virus infection, and methods for antiviral chemotherapy.]

[VETMI 701 Pathogenesis of Viral Diseases (also VETMED 619)]

Spring. 2 credits. Given during 8-week spring distribution period, January-March. Open to graduate students and advanced undergraduates by permission of instructor. Strongly recommended prerequisite: Immunology. Letter grades only. Offered odd-numbered years. Not offered spring 2001. Microbiology faculty.

Course content and objectives: the course will focus on the balance between host defense against viral infections and the mechanisms by which viruses perpetuate themselves in human and animal populations. In the process, the mechanisms of cell and animal infection, spread between cells, disease mechanisms, and the roles of the immune response in enhancing and suppressing disease will be explored. This will include a systems-based approach exploring the pathogenesis of disease in the CNS, gastrointestinal, hepatic, tegumentary, respiratory, and urogenital systems. The basic principles of virus taxonomy, structure, and replication will be included to introduce various viral groups and their special properties. Methods of intervention (vaccination, antiviral drugs) will also be covered. Lectures are derived from relevant current literature; Nathanson's *Viral Pathogenesis*, 1997; and Field's *Virology*, third edition, 1996. Relevant materials will be placed on reserve in the veterinary library.]

[VETMI 702 Molecular Biology and Immunology of Host-Parasite Interactions (Graduate) (also VETMED 620)]

Spring. 2 credits. S-U grades optional. Offered even-numbered years. E. J. Pearce. See description for VETMED 620.]

[VETMI 705 Advanced Immunology (Graduate) (also Biological Sciences 705)]

Spring. 4 credits. Prerequisite: VETMI 315 Basic Immunology or permission of instructor. Letter grades only. Offered even-numbered years. R. G. Bell and staff. Coverage at an advanced level of molecular and cellular immunology.]

VETMI 706 Immunology Seminar Series (Graduate)

Fall, spring. No credit. Required of all graduate students in the Field of Immunology. S-U grades only. Fall, R. Bell; spring, D. Holowka.

Presentations of research investigations by Cornell faculty members, postdoctoral fellows, and graduate students in the Field of Immunology and by invited speakers from other institutions.

VETMI 707 Advanced Work in Bacteriology, Virology, and Immunology (Graduate)

Fall, spring. 1-3 credits. By permission of instructor. S-U grades optional. Microbiology staff.

This course is designed primarily for graduate students with a good background in pathogenic microbiology and immunology. It may be elected by veterinary students who are properly prepared.

VETMI 708 Selected Topics in Animal Virology

Spring, odd-numbered years. 2 credits.

Letter grades only. Microbiology faculty. Principles of animal virus biology with focus on mechanisms in viral pathogenesis.

VETMI 710 Microbiology Seminar (Graduate)

Fall, spring. 1 credit. Required of all graduate students in the Department of Microbiology and Immunology. S-U grades only. G. Whittaker.

VETMI 719 Immunology of Infectious Diseases and Tumors (also Biological Sciences 706) (Graduate)

Spring. 2 credits. Prerequisite: VETMI 315 Basic Immunology or permission of instructor. S-U grades optional. Offered odd-numbered years. E. Y. Denkers and staff.

Coverage at an advanced level of the immunology of diseases caused by selected bacterial, viral, protozoan, and helminthic parasites, and tumor immunology.

VETMI 737 Advanced Work in Animal Parasitology (Graduate)

Fall, spring. 1-3 credits. For advanced undergraduate, graduate, and veterinary students. Letter grades only.

D. D. Bowman and other faculty.

This course is intended for advanced undergraduate, graduate, and veterinary students with interests in parasitology research.

VETMI 770 Advanced Work in Avian Diseases (Graduate)

Fall, spring. 1-3 credits. By arrangement with instructor. Letter grades only. Microbiology faculty.

VETMI 772 Advanced Work in Aquatic Animal Diseases (Graduate)

Fall, spring. 1-3 credits. By arrangement with instructor. S-U grades only. P. R. Bowser.

VETMI 783 Seminars in Parasitology (Graduate)

Fall, spring. 1 credit. Open to veterinary students or graduate students; others by permission of instructor. S-U grades only. D. D. Bowman.

This is a seminar series designed to acquaint students with current research in the field of parasitology. The range of topics is determined, in part, by the interests of those participating and may include such topics as the ecology of parasitism, parasite systematics, wildlife parasitology, and parasitic diseases of plants and animals, including humans.

Molecular Medicine

VETMM 470 Biophysical Methods (also A&EP 470) (enroll in VETPR 470)

Spring. 3 credits. Prerequisite: permission of instructor. Letter grades only. M. Lindau.

This course is an overview of the diversity of modern biophysical experimental techniques used in the study of biological systems at the cellular and molecular level found in articles published in the *Biophysical Journal*. Topics covered include methods that examine both structure and function of biological systems: light microscopy, fluorescence microscopy, Fourier optics and image processing, confocal and multiphoton microscopy, phase contrast, electron microscopy, X-ray diffraction and

protein structure determination, multidimensional NMR, spectroscopy, chromophores, calcium measurements, resonance energy transfer, membrane biophysics, electrophysiology, ion channels, action potentials, ligand-gated channels, fluctuation analysis, patch-clamp, molecular biology of ion channels, rapid kinetics, caged compounds, transmitter release, capacitance measurements, amperometry, optical traps, and molecular force measurements. The course format includes assigned literature reviews by the students on specific topics and individual students' presentation of these topics. The course is intended for students of the engineering, physics, chemistry, and biological disciplines who seek an introduction to modern biophysical experimental methods. Due to the interdisciplinary nature of the course, students will have diverse backgrounds. A basic knowledge of and interest in physics and mathematics is expected but strong attempts are made to give an intuitive understanding of the mathematics and physics involved. Some knowledge of physical chemistry, molecular and cell biology, or neurobiology will be helpful. Depending on individual backgrounds all students will find certain aspects easy and other aspects demanding.

VETMM 610 Cellular and Molecular Pharmacology (enroll in VETPR 610)

Fall. 2 credits. By permission of the instructors. S-U grades optional. Offered even-numbered years. G. A. Weiland and molecular medicine faculty.

This graduate-level course surveys the molecular and cellular aspects of receptor mechanisms, signaling pathways, and effector systems. Topics include drug-receptor interactions; ligand- and voltage-gated ion channels; G protein pathways; growth factor signaling; lipid signaling; calcium; nutrient and nitric oxide signaling; and mechanisms of receptor-mediated effects on neural excitability, electrical pacemakers, muscle contraction, and gene expression.

[VETMM 611 Systems Pharmacology (enroll in VETPR 611)]

Spring. 2 credits. By permission of the instructors. S-U grades optional. Offered even-numbered years. G. A. Weiland and molecular medicine faculty.

This graduate-level course surveys system- and organ-related aspects of pharmacology. Topics include drug disposition; pharmacokinetics; autonomic pharmacology; central nervous system pharmacology; pharmacology of inflammation, allergy and platelet function; cardiovascular, gastrointestinal and endocrine pharmacology; and chemotherapy, including antimicrobial agents and cancer chemotherapy.]

VETMM 672 Protein Kinetics (enroll in VETPR 672) (also CHEM 672)

Fall. 4 credits. Prerequisite: CHEM 288 or 390, BIOBM 331, or permission of instructor. Letter grades only. B. A. Baird.

This course focuses on protein interactions with ligands and consequent changes in structure and activity. Topics include protein structure and dynamics; thermodynamics and kinetics of ligand binding; steady state and transient enzyme kinetics; enzyme catalysis and regulation; and role of cell membrane receptors in regulating cellular activities.

VETMM 700 Calcium as a Second Messenger in Cell Activation (enroll in VETPR 700)

Fall. 2 credits. By permission of instructor. Lecture-discussion. S-U grades only. Offered even-numbered years. C. M. S. Fewtrell.

This course focuses on regulation of intracellular calcium and techniques for studying calcium movements and distribution in cells. Topics include calcium channels and exchangers, calcium-binding proteins, and calcium stores; phosphatidylinositol turnover, release of calcium from intracellular stores, and activation of calcium influx; calcium gradients and oscillations; mechanisms of exocytosis and the proteins involved. Each topic will be introduced with a lecture followed by discussion of recent papers from the literature.

VETMM 701 Organ System Toxicology (enroll in VETPR 701) (also TOX 611)

Fall. 1 credit. For graduate students in environmental toxicology. S-U grades only. Offered even-numbered years. W. S. Schwartz.

This is a minicourse on molecular mechanisms involved in chemical toxicity. Specific examples of toxicity in organ systems such as the nervous system, kidney, liver, respiratory tract, and cardiovascular system will be considered.

[VETMM 703 Receptor-Ligand Interactions (enroll in VETPR 703) (also BIONB 790-02)]

Fall. 2 credits. By permission of the instructors. S-U grades optional. Offered odd-numbered years. R. E. Oswald and G. A. Weiland.

The course covers both the practical and theoretical tools for the study of ligand-receptor interactions, emphasizing the quantitative and physical chemical aspects of receptor theory. Topics discussed are basic methods of radioligand binding assays, including separation and measurement of bound and free ligand; characterization of receptor function; analysis of receptor structure; thermodynamic basis of the binding; methods of analyzing equilibrium binding; equilibrium binding for complex binding mechanisms; and kinetics of simple and complex binding mechanisms.]

VETMM 704 CNS Synaptic Transmission (enroll in VETPR 704)

Spring. 2 credits. Maximum enrollment 20 graduate students and undergraduate seniors by permission of instructor. S-U grades optional. Offered odd-numbered years. L. M. Nowak.

This is a survey course in vertebrate central nervous system physiology and pharmacology, and it focuses on mechanisms of neurotransmitter action at the membrane and cellular levels. Roles of selected neurotransmitters in normal and dysfunctional brains are covered. Topics are introduced in lectures and followed up in discussions of recent journal articles.

VETMM 705 Molecular Mechanisms of Receptor-G Protein Coupled Signaling (enroll in VETPR 705)

Spring. 2 credits. S-U grades optional. Offered odd-numbered years. R. A. Cerione.

This course focuses on the mechanisms of action of GTP binding proteins. Several receptor-coupled signaling systems are

examined, including adenyl cyclase, vertebrate vision, phosphatidylinositol lipid turnover, receptor systems regulating various ion channels, and receptors involved in cell growth regulation.

VETMM 706 Growth Factor-Coupled Signaling (enroll in VETPR 706) (also BIOBM 734)

Spring. 0.5 credits. By permission of the instructor. S-U grades optional. Offered odd-numbered years. R. A. Cerione.

The general theme of this course will be mitogenic signaling pathways. Receptor tyrosine kinases, src, ras, and ras-regulatory proteins will be covered.

VETMM 707 Protein NMR Spectroscopy (enroll in VETPR 707) (also BIOBM 730)

Spring. 2 credits. S-U grades optional. Offered odd-numbered years. R. E. Oswald and L. K. Nicholson.

The fundamentals of NMR will be presented and the student will acquire the tools necessary to establish an in-depth understanding of multidimensional, multinuclear NMR experiments. Application of the technique to proteins for assignment of resonances, determination of structure, and characterization of dynamics will be presented. Special approaches for applying solution NMR techniques to large proteins will be discussed.

VETMM 708 Lipid Second Messengers (enroll in VETPR 708)

Spring. 2 credits. Students with a general biology background may enroll by permission of instructor. Lecture-discussion. S-U grades optional. Offered odd-numbered years. H. A. Brown.

This course covers the biochemical pathways involved in the production of lipid second messengers. These pathways function as essential elements of cellular signal transduction cascades. Topics include pathways of phospholipid synthesis, regulation of major mammalian phospholipases by receptors linked through G-proteins and tyrosine kinase receptors to intracellular cascades, and subsequent metabolism of lipid products. The roles of lipids in regulating cell processes, such as membrane structure, exocytosis, cell cycle, and apoptosis, are topics for discussion following reviews of recent publications. A background in general biochemistry is recommended.

VETMM 709 Cancer Cell Biology (enroll in VETPR 709) (also Biological Sciences 750) (Graduate)

Spring. 3 credits. Prerequisite: Biological Sciences 330 or 331 or equivalent. Recommended: graduate courses in biological sciences. Letter grade only. Offered odd-numbered years. J. L. Guan, R. A. Levine, B. U. Pauli, and A. Yen.

This advanced graduate course will cover molecular, cellular, and genetic aspects of cancer. The course is divided into four sections. The first section will address tumor etiology, progression, and metastasis. Topics will include causes of cancer, morphologic and genetic models of cancer progression, tumor angiogenesis, tumor invasion, and metastasis. The second section will discuss cell-matrix and cell-cell interactions in cancer. Topics will include the structure and function of the major matrix receptor integrin family of cell adhesion molecules, integrin interactions with the cytoskeleton, intracellular signaling pathways in cell-ECM interactions, integrin-

mediated signaling in cellular growth regulation, changes of integrins in human tumors and metastasis, structure and function of cadherin family of cell-cell adhesion molecules, and signaling mechanisms in cell-cell interactions in normal development and cancer. The third section will be on the cell cycle. It will develop properties of the cell cycle, how its phases are measured, and changes associated with cell transformation. The fourth section will discuss the signaling pathways that regulate cell cycle progression and how oncogenes and tumor suppressor genes regulate cell proliferation, differentiation, and apoptosis.

Special Projects and Research in Pharmacology

Fall, spring, summer. 1-3 credits. By arrangement with instructor. S-U grades optional. Independent study or research. Field of pharmacology faculty.

These courses cover a variety of topics related to the research interests of the faculty.

VETMM 711 The Role of Calcium in Stimulus-Secretion Coupling (enroll in VETPR 711)

C. M. S. Fewtrell.

VETMM 713 Mechanisms of Growth-Factor Action (enroll in VETPR 713)

R. A. Cerione.

VETMM 714 Central Nervous System Neurotransmitters (enroll in VETPR 714)

L. M. Nowak.

VETMM 718 Structure-Function of the Nicotinic Acetylcholine Receptor (enroll in VETPR 718)

R. E. Oswald.

VETMM 720 Modulation of Nicotinic Acetylcholine Receptor Function (enroll in VETPR 720)

G. A. Weiland.

VETMM 724 The Control of Hormone Secretion (enroll in VETPR 724)

G. W. G. Sharp.

VETMM 730 Graduate Research in Molecular Medicine (enroll in VETPR 730)

Fall, spring, and summer. 1-12 credits. By permission of instructor. S-U grades only. This course is offered by individual faculty members in the Department of Molecular Medicine for graduate students undertaking research toward M.S. or Ph.D. degrees.

Directed Readings in Pharmacology

Fall, spring, and summer. 1-3 credits each topic. By arrangement with instructor. S-U grades optional. Field of pharmacology faculty. Reading and discussions.

These courses are offered to small groups or to individual students.

VETMM 742 Receptor Mechanisms (enroll in VETPR 742)

G. A. Weiland.

VETMM 745 Biochemical Neuropharmacology (enroll in VETPR 745)

G. A. Weiland.

VETMM 747 Amino Acid Neurotransmitters (enroll in VETPR 747)

L. M. Nowak.

VETMM 748 Stimulus-Secretion Coupling (enroll in VETPR 748)

C. M. S. Fewtrell.

VETMM 750 Cell Calcium (enroll in VETPR 750)

C. M. S. Fewtrell.

VETMM 760 Advanced Topics in Pharmacology (enroll in VETPR 760)**Population Medicine and Diagnostic Sciences****VETPMD 664 Introduction to Epidemiology (Graduate) (enroll in VETCS 664)**

Fall, 3 credits. Prerequisites: Statistics and Biometry 601 (College of Agriculture and Life Sciences) may be taken concurrently or by permission of instructor. S-U grades optional. H. N. Erb.

Lectures and discussion deal with the fundamentals of epidemiology. Current topics in epidemiology from the fields of nutrition, infectious and chronic diseases, occupational medicine, and veterinary medicine will be reviewed to illustrate the principles and practice of epidemiology, especially of clinical-trial design and infectious-disease epidemiology.

VETPMD 665 Study Designs (Graduate) (enroll in VETCS 665)

Spring, 2 credits. Prerequisites: VETCS 664 and Statistics and Biometry 601 (College of Agriculture and Life Sciences). S-U grades optional. H. O. Mohammed.

Design and interpretation of cross-sectional, case-control, and cohort studies (including controlled clinical trial) are covered. Design issues will include sample size, bias, and relative advantages and disadvantages.

The course objectives are (1) to know the difference between different epidemiologic study designs and relative advantages and disadvantages of each; (2) given a problem (usually a field situation), be able to design an appropriate epidemiologic study; (3) be able to effectively analyze and criticize published epidemiologic studies.

The course will consist of lectures on the principles of epidemiologic study design and related issues (sample size calculations, validity and precision, and identification and minimizing of bias); basic analysis of epidemiologic data; and discussion of published epidemiologic studies. These studies include observational cohort studies (prospective and retrospective), cross-sectional studies, case-control studies, and hybrid studies (ambidirectional, and other hybrid designs).

VETPMD 666 Advanced Methods in Epidemiology (Graduate) (enroll in VETCS 666)

Fall, 3 credits. Prerequisites: VETCS 665 and Statistics and Biometry 602 (College of Agriculture and Life Sciences). S-U grades optional. M W F 8:45-9:35. Y. T. Grohn.

Concepts introduced in VETPMD 664 and VETPMD 665 are further developed, with emphasis on statistical methods. Topics include interaction, effect modification, stratified analysis, matching and multivariate (logistic regression) methods, survival analysis, and strategies for the analysis of epidemiologic data.

VETPMD 700 Special Projects in Diagnostic Endocrinology (enroll in VETDL 700)

Fall, spring, 1-3 credits. By permission of instructor. Letter grades only. T. J. Reimers. An independent study course. Students have the opportunity to research a particular topic in diagnostic/clinical endocrinology of animals.

VETPMD 701 Special Projects in Infectious Diseases (enroll in VETDL 701)

Fall, spring, 1-3 credits. By permission of instructor. S-U grades optional. Diagnostic laboratory faculty.

This course provides laboratory experience with attention to specific aspects of infectious disease problems.

VETPMD 702 Special Topics in Infectious Diseases (enroll in VETDL 702)

Fall, spring, 1-3 credits. By permission of instructor. S-U grades optional. Diagnostic laboratory faculty.

The objective of this course is to offer a broad exposure to various aspects of infectious diseases.

VETPMD 703 Doctoral-Level Thesis Research (Graduate) (enroll in VETDL 703)

Fall, spring, 6-9 credits. By permission of instructor. S-U grades only. Diagnostic Laboratory faculty.

Research leading to a Ph.D. degree.

VETPMD 704 Master's - Level Thesis Research (Graduate) (enroll in VETDL 704)

Fall, spring, 1-3 credits. By permission of instructor. S-U grades only. Diagnostic Laboratory faculty.

Research leading to an M.S. degree.

VETPMD 705 Interdisciplinary Approaches to Animal Health (enroll in VETDL 705)

Spring, 3 credits. Minimum enrollment 7. S-U grades optional. A. L. Rivas.

VETPMD 707 Clinical Biostatistics (Graduate) (enroll in VETCS 707)

Spring, 2 credits. For veterinary residents or graduate students. Letter grades only. Offered odd-numbered years. H. N. Erb, Y. T. Grohn, H. O. Mohammed, and J. M. Scarlett.

This course will explain the theory behind and interpretation of parametric and nonparametric statistical techniques commonly employed in research/clinical medicine. Students will analyze small data sets using a commercial statistical software package.

VETPMD 708 Epidemiology Seminar Series (Graduate) (enroll in VETCS 708)

Fall, spring, 1 credit. S-U grades only. Epidemiology faculty.

Advanced theoretical and analytical epidemiologic concepts and techniques will be discussed.

VETPMD 766 Graduate Research (Graduate) (enroll in VETCS 766)

Fall, spring, summer. Credit and hours TBA. Students must be registered in masters or Ph.D. program in epidemiology and obtain permission of the graduate faculty member concerned. S-U grades only. Epidemiology faculty.

This course enables students outside the section of Epidemiology to receive graduate

research credits for projects with epidemiological components.

VETPMD 799 Independent Studies in Epidemiology (enroll in VETCS 799)

Fall, spring, 1-3 credits. H. N. Erb, Y. T. Grohn, H. O. Mohammed, and J. M. Scarlett.

The purpose of this course is to investigate an epidemiologic topic with one of the instructors. It provides experience in problem definition, research design, and the analysis of epidemiologic data.

FACULTY ROSTER

Abou-Madi, Noha, D.V.M., U. of Montreal (Canada). Lecturer, Clinical Sciences
 Aguirre, Gustavo D., Ph.D., U. of Pennsylvania.
 Alfred H. Caspary Professor, Clinical Sciences
 Ainsworth, Dorothy M., Ph.D., U. of Wisconsin-Madison. Assoc. Prof., Clinical Sciences
 Antczak, Douglas F., Ph.D., U. of Cambridge (England). Dorothy Havemeyer McConville Professor of Microbiology and Immunology
 Appel, Max J., Ph.D., Cornell U. Prof. Emeritus, Microbiology and Immunology
 Appleton, Judith A., Ph.D., U. of Georgia. Assoc. Prof., Microbiology and Immunology
 Baines, Joel, Ph.D., Cornell U. Assoc. Prof., Microbiology and Immunology
 Barr, Stephen C., Ph.D., Louisiana State U. Assoc. Prof., Clinical Sciences
 Battison, Andrea, L., D.V.M., U. of Saskatchewan. Instructor, Population Medicine and Diagnostic Sciences
 Bell, Robin G., Ph.D., John Curtin School (Australia). Prof., Microbiology and Immunology
 Beyenbach, Klaus, Ph.D., Washington State U. Prof., Biomedical Sciences
 Bliss, Stuart, D.V.M., Cornell U. Instructor, Clinical Sciences
 Bloom, Stephen E., Ph.D., Penn State U. Prof., Microbiology and Immunology
 Blue, Julia T., D.V.M., OK State. Ph.D., U. of Pennsylvania. Assoc. Prof., Population Medicine and Diagnostic Services
 Bowman, Dwight D., Ph.D., Tulane U. Assoc. Prof., Microbiology and Immunology
 Bowser, Paul R., Ph.D., Auburn U. Prof., Microbiology and Immunology
 Brown, H. Alex, Ph.D., U. of North Carolina-Chapel Hill. Asst. Prof., Molecular Medicine
 Butler, Emily C., D.V.M., Cornell U. Instructor, Clinical Sciences
 Casarett, Alison P., Ph.D., U. of Rochester. Prof. Emeritus, Biomedical Sciences
 Casey, James W., Ph.D., U. of Chicago. Assoc. Prof., Microbiology and Immunology
 Center, Sharon A., D.V.M., U. of California-Davis. Prof., Clinical Sciences
 Cerione, Richard A., Ph.D., Rutgers U. Prof., Molecular Medicine
 Chang, Yung Fu, Ph.D., Texas A&M. Assoc. Prof., Population Medicine and Diagnostic Sciences
 Clark, Theodore G., Ph.D., SUNY-Stony Brook. Asst. Prof., Microbiology and Immunology
 Collins, Ruth N., Ph.D., Imperial Cancer Research Center. Asst. Prof., Molecular Medicine
 Cook, Vanessa L., Veterinary MB, Cambridge U. (U.K.). Lecturer, Clinical Sciences
 Cooper, Barry J., Ph.D., U. of Sydney (Australia). Prof., Biomedical Sciences
 Davies, Christopher, Ph.D., D.V.M., Cornell U. Asst. Prof., Microbiology and Immunology
 Denkers, Eric Y., Ph.D., U. of Wisconsin-Madison. Asst. Prof., Microbiology and Immunology
 deLahunta, Alexander, Ph.D., Cornell U. James Law Professor of Veterinary Anatomy, Biomedical Sciences
 Dietert, Rodney R., Ph.D., U. of Texas-Austin. Prof., Microbiology and Immunology
 Divers, Thomas J., D.V.M., U. of Georgia. Prof., Clinical Sciences
 Dobson, Alan, Ph.D., U. of Cambridge (U.K.). Prof. Emeritus, Biomedical Sciences

- Dubovi, Edward J., Ph.D., U. of Pittsburgh. Assoc. Prof., Population Medicine and Diagnostic Sciences
- Ducharme, Normand G., D.V.M., U. of Montreal (Canada). Prof., Clinical Sciences
- Dykes, Nathan L., D.V.M., Cornell U. Lecturer, Clinical Sciences
- Erb, Hollis N., Ph.D., U. of Guelph (Canada). Prof., Population Medicine and Diagnostic Sciences
- Evans, Howard E., Ph.D., Cornell U. Prof. Emeritus, Veterinary and Comparative Anatomy, Biomedical Sciences
- Farnum, Cornelia, Ph.D., U. of Wisconsin-Madison. Prof., Biomedical Sciences
- Fewtrell, Clare, D.Phil., U. of Oxford (England). Assoc. Prof., Molecular Medicine
- Flanders, James A., D.V.M., U. of California-Davis. Assoc. Prof., Clinical Sciences
- Fortune, Joanne E., Ph.D., Cornell U. Prof., Biomedical Sciences
- Fox, Francis H., D.V.M., Cornell U. Prof. Emeritus, Clinical Sciences
- French, Tracy W., D.V.M., Purdue U. Assoc. Prof., Biomedical Sciences
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