**VETERINARY CLINICAL STUDIES - NEW BOLTON CENTER (VCSN)**

**VCSN 630 Equine Neonatology & Intensive Care Medicine**
The objectives of this course are to: (1) Introduce students to neonatal physiology and behavior as it applies to the foal; (2) Acquaint students with the clinical signs and pathophysiologic mechanisms of diseases in neonates; and (3) Provide students experience in the neonatal intensive care unit learning monitoring techniques (e.g. noninvasive blood pressure measurements, PCV, TP, stall side blood glucose, etc.) Observing normal and abnormal neonatal behavior and neonatal/maternal interactions, learning techniques of neonatal restraint, and assisting with diagnostic and therapeutic procedures as well as general nursing. Lectures will focus on foal diseases, intensive care therapies, periparturient problems, ventilatory support, musculoskeletal disorders, pharmacology and the neonate. Seminars will be used to apply lecture and reading material to clinical case discussions. A set of clinically-oriented problems covering case presentations, blood gas analysis, nutrition formulations, fluid therapy, nursing care protocols and periparturient events will be completed during the fourth quarter. The course grade will be based upon evaluation of clinical case problems, seminar participation, and mastering clinical skills (monitoring techniques, etc.) learned during foal-sitting. Enrollment requires approval of the course organizer and satisfactory academic standing. Taught by: Dr. M. Linton and Staff
Activity: Lecture
4.0 Credit Hours
Notes: Limitations: 70 students max. for foal-sitting nursing shifts. Note: YOU MUST PROVIDE YOUR OWN TRANSPORTATION TO AND FROM NEW BOLTON CENTER

**VCSN 632 Diseases & Management of Sheep & Goats**
This course is an introduction to small ruminant medicine and surgery. Flock and herd health programs involve control of infectious, parasitic, reproductive and metabolic disorders and provision of proper housing, feeding and reproductive management systems. Prevalent diseases and management systems of the Eastern U.S. will receive emphasis. Taught by: Dr. M. Fecteau
Activity: Lecture
3.0 Credit Hours

**VCSN 633 Animal Health Economics**
An introduction to a variety of economic concepts and decision making techniques that relate to the business of an agricultural enterprise and to the impact of veterinary services on that enterprise. Discussion of the role of production medicine in the overall profitability of animal agriculture. Taught by: Dr. D. Galligan and Staff
Activity: Lecture
2.0 Credit Hours
Notes: Conflict: Scheduled concurrently with Clinical Exercises in Quarter 1

**VCSN 634 Clinical Biostatistics**
This course presents a unified approach to the analysis and interpretation of clinical data. We start with a discussion of general linear models and show the types of problems to which they apply, and then move to generalized linear models, to survival models, and finally to general estimating equations. Our goal is to acquaint participants with a fairly comprehensive array of approaches to data analysis and, most particularly, to circumstances to which they apply. The objective is to prepare students for research activities, either as a career, or as a step towards ‘Board Certification’ enabling them to plan studies, analyze data ensuing from studies, and to critically read articles in their area of interest.
Taught by: Dr. D. Stefanovski and Staff
Activity: Lecture
2.0 Credit Hours
Notes: Limitations: Min: 6 students/Max: 16 students

**VCSN 635 Equine & Farm Animal Anesthesia**
This course will discuss sedation and intravenous or inhalant anesthesia of equine, food animal and cameldid patients. The lectures will review the clinical pharmacology of the commonly used anesthetic drugs and the anatomic and physiologic differences among the species and their relevance to anesthetic management. Patient preparation, drug selection, induction and intubation techniques, intra-operative monitoring and management of cardiovascular and respiratory abnormalities, post-operative analgesia and recovery complications will also be discussed. Three case-based problems with multiple questions related to various aspects of anesthesia care will be distributed during the course. The problems are take-home, open-book and students may work alone or in pairs. Time will be spent discussing the cases after the written answers are turned in.
Taught by: Dr. K. Olson and Staff
Prerequisite: VSUR 604
Activity: Lecture
2.0 Credit Hours
Notes: Note: This course is a prerequisite for VCSN 815 and VCSN 875 Large Animal Anesthesia Rotation - NBC. This course is required for Equine Majors
VCSN 636 Clinical Applications of Pharmacology
This course is focused on the clinical pharmacological management of the major problems in veterinary practice. The vast majority of lectures directly apply to companion animals but when necessary, to emphasize a drug group or specific clinical problem, there are also several large animal lectures. This is an extension of core pharmacology and not an expanded version. The lectures will be given by the clinical and basic sciences faculty in their areas of expertise. Emphasis will be on the clinical aspects of drug therapy such as dosage range, duration of therapy, evaluation of therapy, and problems encountered with current drug therapy. Pharmacological therapy in the following areas of medicine and surgery are covered: antibiotics, cardiovascular, neurology, respiratory, urinary, gastrointestinal, endocrine, emergency medicine, ophthalmology, chemotherapeutic agents, fluid therapy, anti-inflammatory, pain medications and other topics as needed for the most comprehensive clinical overview. Emphasis is on case-based approaches to drug therapy. The major objectives of this course are: (1) Provide practical information on rational drug therapy before entering the clinics and the real world of veterinary practice. (2) Provide a sound basis for rationally evaluating the presently available drugs and the drugs of the future. The course grade is based on a weekly quiz and/or mid-term/final. Taught by: Dr. J. Orsini and Staff
Prerequisite: VBMS 607 AND VPTH 605 AND VPTH 604
Activity: Lecture
4.0 Credit Hours

VCSN 637 Animal Production Systems
This elective course provides an overview of: (i) management and operational basics of food animal production systems (dairy, beef, swine, poultry, and aquaculture), (ii) contemporary issues concerning current practice and sustainable future of animal production systems, e.g., food safety & biosecurity, antibiotics & antimicrobial resistance, nutrient management & environmental regulations, and animal welfare & public concerns. Students will work in teams on debates from pre-arranged topics, and will complete periodic assignments. Course grades will be based on class participation (40%), homework assignments (30%), and team debate performance (30%).
Tought by: Dr. Z. Dou and Staff
Activity: Lecture
2.0 Credit Hours
Notes: Limitations: Capacity of classroom

VCSN 638 Introduction to Animal Welfare
This course will cover the basic principles, history, and application of animal welfare science for multiple species. Over a series of lectures, the complex issue of assessing good versus poor welfare will be addressed. The first few lectures will provide students with the background of this field, as well as key terms which define the assessment methods of animal welfare science. The multifaceted issue of poor versus good welfare will be addressed in a lecture on ethics and sociology. The background lectures will also cover the disparity in the assessment of pain, pleasure, stress, and suffering based on applying physiological versus behavioral measurements. Given the tools provided by the background lectures, the students will then learn about species-specific welfare issues in the subsequent lectures to include swine, poultry, bovine, equine, aquaculture, exotic/zoo animals, lab animals, shelter animals, companion animals and current events. Following each one-hour lecture, the students will engage in an hour of hands-on activities, and debates concerning that week's topic. Students will also participate in one wet lab where they will have the opportunity to apply methods of welfare assessment that they have learned in class.
Taught by: Dr. M. Pierdon and Staff
Activity: Lecture
4.0 Credit Hours
Notes: Limitations: Permission of instructor since class is capped at 25 participants

VCSN 639 Animal Welfare Science
This course is a foundational course for students enrolling in the Animal Welfare Certificate Program. This course covers the basic principles, history, and application of animal welfare science. Over a series of video modules, online discussions, assignments, and quizzes, this course will teach students to assess the welfare of animals in a variety of settings using science-based methods and reasoning. Students will learn current welfare issues by species. This class will engage in activities that build the skills to find and assess scientific sources of information. Finally, the link between science and ethics will be explored such that students understand various ethical frameworks and how they relate to animal welfare. The objective of the course is to provide students with the background and tools to apply animal welfare science in order to facilitate students' ability to successfully engage in welfare deliberations and welfare science in a variety of fields.
Tought by: Dr. Meghann Pierdon and Staff
Prerequisites: Any student accepted for enrollment in the Animal Welfare and Behavior Certificate Program (a Bachelor's Degree is required and a background in biology or animal science is preferred.)
Activity: Online Course
6.0 Credit Hours
Notes: Limitations: 20-25 students. At present, this online course will not be offered to UPenn VMD students.
VCSN 640 Large Animal Medicine - NBC
The course is comprised of advanced lectures and discussions on medical diseases of large domestic animals. Laboratory sessions will include ‘hands-on’ experience in performing the more common diagnostic procedures in large animal medicine, including: urethral catheterization of horses; rectal examination; ophthalmic examinations; epidural anesthesia (bovine); nasolacrimal duct flushing; cardiovascular examinations; use of ultrasound equipment; venipuncture in cattle and horses; intravenous injections in cattle, balling gun procedure for cattle; TB testing in cattle and endoscopy of the horse. Two in-course Progressive examinations and a course Final examination will be given. Taught by: Dr. R. Nolen-Walston and Staff
Prerequisite: Core Medicine Courses
Activity: Lecture
7.0 Credit Hours

VCSN 641 Advanced Poultry Medicine - NBC
This lecture/laboratory course is designed to provide students with a working knowledge of the recognition and diagnosis of selected diseases of poultry. Lectures will include discussion of the clinical, post-mortem and technical aspects of the diagnosis of selected avian diseases. The laboratory will provide each student with an opportunity to necropsy birds. Field visits to local poultry farms may be taken. The course grade will be based on weekly quizzes and a group project.
Taught by: Dr. S. Davison and Staff
Prerequisite: VPTH 602 AND VMED 608
Activity: Lecture
2.0 Credit Hours
Notes: Limitations: Maximum of 40 students. CONFLICT: VCSN 648 Equine Sports Medicine

VCSN 642 Dairy Cattle Nutrition - NBC
The complexity of evaluating and balancing rations requires computer models. CPM-Dairy - developed at Cornell University, The University of Pennsylvania and The William H. Miner Agricultural Research Institute - evaluates and formulates rations according to a modified National Research Council (NRC) model and according to The Cornell Net Carbohydrate and Protein System (CNCPs). CPM-Dairy will be used to describe nutrient requirements, supplies and utilization. Environmental effects on nutritional requirements will be demonstrated. The dynamics of ruminal fermentation and microbial growth will be illustrated in terms of how they affect nutrient supply. ‘Hands on Computer Sessions’ will lead participants through ration formulation.
Taught by: Dr. L. Baker and Staff
Prerequisite: VMED 605
Activity: Lecture
3.0 Credit Hours
Notes: CONFLICTS: Mon. 8-10 am conflicts with VCSN646 Equine Lameness; Thurs. 4-6 pm conflicts with VCSN 647 Equine Orthopedics

VCSN 643 Large Animal Reproduction - NBC
This course covers in-depth reproductive management of cattle, horses, swine and small ruminants. Emphasis is placed on the herd or flock as a unit rather than on the individual animal. This course is the same course as VCSN644 but with one-half of the laboratory time. The course is intended for those students who intend to pursue a career that will be exclusively or predominantly companion animal. A three-hour canine reproduction laboratory is included. The Laboratories include demonstrations by clinicians and hands-on practical experience for students in evaluating the male and the female reproductive status: PATH F - female pathology, PATH M - male pathology, OB1 - obstetrics, B&R - bull and ram breeding soundness examination, DOG - dog breeding soundness examination, vaginal cytology of the bitch, MARE1 - palpation of the genital tract per rectum of mare, COW1 - physical exam of the bovine genital tract, ULTRA - ultrasonography of the genital tract of animals. Therapeutic information will be covered in problem-based cases that will be solved and formally presented by small student groups. Grades will be based on the therapeutic presentations, laboratory participation, mid-term exam and a comprehensive final examination. Taught by: Dr. P. Sertich and Staff
Prerequisite: VMED 610
Activity: Lecture
3.0 Credit Hours
Notes: Limitations: No Drop/Add

VCSN 644 Large Animal Reproduction - NBC
The course covers in-depth reproductive management of cattle, horses, swine, sheep and small ruminants. Emphasis is placed on the herd or flock as a unit rather than on the individual animal. Laboratories include demonstrations by clinicians and hands-on practical experience for students in evaluating the male and the female reproductive status of dogs and large domestic animals. Therapeutic information will be covered in problem-based cases that will be solved and formally presented by small student groups. Grades will be based on the therapeutic presentations, laboratory participation, mid-term exam and a comprehensive final examination. In addition to the laboratories listed in VCSN643 are the following eight laboratories: OB2 - fetomy, STALL - stallion breeding soundness examination SWINE - boar semen evaluation, heat detection and AI of sows, MARE2 - mare breeding soundness examination, palpation, MARE3 - using breeding soundness examination to solve infertility case, palpation, COW2 - bovine estrous cycle, palpation, COW3 - pregnancy diagnosis, palpation, COW4 - therapeutics, palpation. Taught by: Dr. P. Sertich and Staff
Prerequisite: VMED 610
Activity: Lecture
4.0 Credit Hours
Notes: Limitations: No Drop/Add. Note: This course is a prerequisite for Course VCSN 774 Large Animal Clinical Reproduction Rotation
VCSN 645 Large Animal Surgery & Surgical Exercises - NBC
Lectures given in this course will cover common surgical problems of the respiratory, the gastrointestinal, the musculoskeletal, and the urogenital systems of horses and of the gastrointestinal system of domestic ruminants. Lecture material will cover the procedures to be done in each laboratory beforehand so that ample opportunity is allowed for preoperative preparation. Lectures are given on anesthesia with special emphasis on drugs to be used during the laboratory sessions. The surgical exercises and related laboratory procedures are designed to teach surgical techniques and principles, surgical anatomy, and basic surgical procedures in horses and domestic ruminants. Students will administer general anesthetics and apply the principles and techniques of physiologic monitoring of anesthetized large animals. The importance and the application of preoperative and postoperative management will be emphasized and students take full responsibility for their patient’s progress throughout the course. The course grade is derived from performance in the laboratories, quality of patient care, participation in conferences, and one final exam. Ponies that fulfill all University Laboratory Animal Resources (ULAR) guidelines may be purchased at the end of the course. Post-requisite: must sign up for VCSN 870 Large Animal Surgery Clinical Rotation 7 Conference Hrs.
Taught by: Dr. E. Parente and Staff
Prerequisite: Core Surgery Courses
Activity: Lecture
4.0 Credit Hours
Notes: Limitations: No Drop/Add; Maximum of 30 students

VCSN 646 Equine Lameness - NBC
This course covers the principles of lameness diagnosis and treatment in horses. The course features didactic lectures, actual lameness examinations, video tape viewing, computer aided learning and a diagnostic nerve block laboratory using cadaver specimens.
Taught by: Drs. M. Ross, D. Levine and Staff
Prerequisites: Core Surgery and Anatomy Courses
Activity: Lecture
4.0 Credit Hours
Notes: CONFLICT: Mon. 8-10 am conflicts with VCSN 642 Dairy Cattle Nutrition.

VCSN 647 Equine Orthopedics - NBC
The course reviews specific techniques in equine orthopaedics, and emphasizes understanding orthopaedic principles that are applicable to all species. Topics include more detailed information on internal fixation, relevant first-aid techniques, osteochondrosis and orthopedic sepsis.
Taught by: Dr. D. Richardson and Staff
Activity: Lecture
1.0 Credit Hour
Notes: CONFLICT: VCSN 642 Dairy Cattle Nutrition

VCSN 648 Equine Sports Medicine - NBC
This seminar course concerns the clinical application of basic physiologic and pathologic principles as they relate to the diagnosis and management of exercise-related diseases in the horse. Material will be presented in light of the demands of specific types of athletic activity. Laboratory demonstrations using the high-speed treadmill will be provided. Hands-on sessions are also provided to demonstrate the collection of arterial blood gas samples and upper airway endoscopy. Paper or oral presentation required.
Taught by: Dr. J. Slack and Staff
Prerequisite: VBMS 601 AND VBMS 605 AND VBMS 606
Activity: Lecture
3.0 Credit Hours
Notes: CONFLICT: VCSN 641 Advanced Poultry Medicine

VCSN 649 Large Animal Diagnostic Imaging - NBC
The course consists of a series of lectures, a radiographic positioning laboratory and an ultrasound/anatomy laboratory. Plain film radiography comprises the majority of the lectures but ultrasound, scintigraphy and prepurchase examination are included. A brief introduction to CT & MRI is also presented. Strong emphasis is placed on the equine species but incorporates radiography of other large animals. The course is designed to cover the basic principles of the different imaging techniques, radiographic and sonographic anatomy, and the basic interpretation of the imaging modalities.
Taught by: Dr. V. Reef and Staff
Prerequisites: Core Medicine, Surgery and Radiology Courses
Activity: Lecture
3.0 Credit Hours
Notes: This course is a prerequisite for the following clinical rotations: VCSN 812,872 Sports Medicine/Imaging and VCSN 814,874 Large Animal Radiology

VCSN 650 Applied Animal Welfare and Behavior
This course aims to provide students with practical skills helpful in the study of animal welfare and in the future offer a bridge to our proposed master’s program. Students will be exposed to critical reading of the scientific literature, development and testing of hypothesis as well as examining experimental paradigms used commonly to probe animal welfare and behavior. The goal of the course is for each student to conceive, develop, write, and present a research proposal on a question of interest in animal welfare that could provide the foundation for a future capstone project. Student assignments will include selected readings, synchronous and asynchronous online discussion of relevant course materials, and an oral presentation and written description of their research proposal.
Taught by: Dr. Thomas Parsons
Prerequisite: Student enrolled in the Animal Welfare Certificate Program who has taken the Animal Welfare Science and/or Animal Behavior course
Activity: Online Course
6.0 Credit Hours
Notes: Limitations: 20-25 students. This course will not be offered to VMD students.
**VCSN 652 Regulations and Animal Welfare**
This course will focus on regulations in the United States that have an impact on animal welfare. It will also look at oversight of research, clinical trials and informed consent in veterinary medicine. Over a series of video modules, online discussions, assignments and quizzes, this course will teach students the history and tenets of the current regulatory framework. Each week a synchronous session will explore the implications of regulations on animal welfare.

Taught by: Meghann Pierdon
Activity: Online Course
3.0 Credit Hours

**VCSN 657 One Health & Global Food Security**
By 2050 can the world sustain a population of over 9 billion people in the face of climate change, limited water and other natural resources, pollution, urbanization, political and income inequality, conflict, changing diets and patterns of disease? An interdisciplinary group of faculty will explore this complex question through six broad trends that affect global food sustainability and environmental health; 1) nutritional needs; 2) changing patterns of communicable and non-communicable diseases of humans and all types of animals; 3) natural resource inventory and management; 4) production technologies (intensive/extensive systems); 5) societal changes impacting production and food demand; 6) food distribution systems and access to food. The course is open to graduate and undergraduate students and will involve student participation and research.

Taught by: Drs. D. Galligan, A. Kelly and Staff
Course usually offered in spring term
Also Offered As: ANTH 361, ANTH 661
Activity: Lecture
4.0 Credit Hours

**VCSN 658 Evolution of Animal Welfare**
This course addresses how changing societal expectations about animal use impact animal welfare expectations.

Taught by: Thomas Parsons
Activity: Online Course
3.0 Credit Hours

**VCSN 659 Contemporary Issues in Animal Welfare**
This course covers contemporary animal welfare issues and some of their ethical implications

Taught by: Thomas Parsons
Activity: Online Course
3.0 Credit Hours

**VCSN 660 Animal Welfare Assessment**
This course is intended to cover the animal welfare assessment requirements as outlined in the ACAW guidelines for board certification, but it also allows any students pursuing the master’s program to improve their welfare assessment abilities. Students must participate in assessment of Companion animals, Poultry production, Hooved stock production, Equids, Laboratory animals and Zoo animals. They must also choose at least 2 to assess from the following: Aquatic animals, aquaculture/fisheries, Wildlife/exotic animals, Animals in exhibitions/entertainment, Animals in education, and Working/assistant animals. Students will work on 3 assessments per week for a total of 9 assessments. The final week of the course will be dedicated to working on case studies from the student’s own experience. This will include identification of a situation where welfare would need to be assessed, determination of how to assess the welfare of the animal(s) and a written report of the assessment, including recommendations for steps that could be instituted so that the welfare could be improved. Each week a video and reading assignments will familiarize students with assessment techniques and tools.

Taught by: Meghann Pierdon
Activity: Online Course
3.0 Credit Hours

**VCSN 661 Swine Neonatology - NBC**
This is an introductory course for students who want to learn more about swine production and swine medicine. It aims to familiarize 2nd and 3rd year veterinary students with several important aspects of swine neonatology/farrowing room management that includes parturient physiology and behavior of both the sow and the piglet, baby pig processing, and sow dystocia. All students will be required to attend the four hours of lecture, and four laboratory shifts. Each laboratory shift is 7 hours and available nights and weekends. Students will be required to monitor the farrowing house for sows in labor and attend the farrowings as needed to critically assess animal well-being. Students will be expected to provide appropriate sow or piglet interventions when indicated. Students will also assist with any routine management tasks such as piglet processing and vaccination. Students will be graded on their participation and success in meeting the course objectives.

Taught by: Dr. T. Parsons and Staff
Activity: Lecture
1.0 Credit Hour

Notes: Limitations: Permission of the Instructor. May be repeated once

**VCSN 662 Swine Neonatology - NBC**
This course is similar to VCSN 661, but provides students with a more intensive experience and the opportunity to pursue a higher level of proficiency in swine neonatology. The course also aims to familiarize 2nd and 3rd year veterinary students with several important aspects of swine neonatology/farrowing room management that includes parturient physiology and behavior of both the sow and the piglet, baby pig processing, and sow dystocia. All students will be required to attend the four hours of lecture, and eight laboratory shifts. Each laboratory shift is 7 hours and available nights and weekends. Students will be required to monitor the farrowing house for sows in labor and attend the farrowings as needed to critically assess animal well-being. Students will be expected to provide appropriate sow or piglet interventions when indicated. Students will also assist with any routine management tasks such as piglet processing and vaccination. Students will be graded on their participation and success in meeting the course objectives.

Taught by: Dr. T. Parsons and Staff
Activity: Lecture
2.0 Credit Hours

Notes: Limitations: Permission of the Instructor; Cannot be repeated
VCSN 663 Swine Husbandry - NBC
This is the second introductory course for students who want to learn more about swine production and swine medicine. It aims to familiarize 2nd and 3rd year veterinary students with several other aspects of swine husbandry and health management. All students will be required to attend four laboratory shifts, and write a short report on an aspect of mutual interest related to swine management or disease. Each laboratory shift is 7 hours and is available nights and weekends. Students will be required to participate in all aspects of swine husbandry with special emphasis given to herd health, reproductive and nutritional management. Students will be graded on their participation and success in meeting the course objectives.

Taught by: Dr. T. Parsons and Staff
Prerequisite: VCSN 661 OR VCSN 662
Activity: Lecture
1.0 Credit Hour
Notes: Limitations: Permission of the Instructor; can be repeated once

VCSN 664 Swine Husbandry - NBC
This course is similar to VCSN 663, but provides students with a more intensive experience and the opportunity to pursue a higher level of proficiency in swine husbandry. This course aims to familiarize 2nd and 3rd year veterinary students with several other aspects of swine husbandry and health management. All students will be required to attend eight laboratory shifts, and write a short report on some aspect of mutual interest related to swine management or disease. Each laboratory shift is 7 hours and is available nights and weekends. Students will be required to participate in all aspects of swine husbandry with special emphasis given to herd health, reproductive and nutritional management. Students will be graded on their participation and success in meeting the course objectives.

Taught by: Dr. T. Parsons and Staff
Prerequisite: VCSN 661 OR VCSN 662
Activity: Lecture
2.0 Credit Hour
Notes: Limitations: Permission of the Instructor; can be repeated once

VCSN 700 Large Animal Medicine -Foundation - NBC
Students in this rotation will assist clinicians in history taking, examinations and the medical management of large animal patients presented to the hospital at New Bolton Center. Students will participate in daily ward and Medicine teaching rounds, Radiology rounds and Pathology rounds. All students, whether in core or elective, will be expected to participate in night and weekend duty on a rotating basis. All students will prepare and present one clinical case discussion for Grand Rounds. Time commitment: at least 8 hours per day plus night and weekend duty.

Taught by: Dr. R. Sweeney and Staff
Also Offered As: VCSN 770
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours

VCSN 701 Large Animal Emergency/Critical Care - Foundation Rotation - NBC
This rotation is designed to teach students basic principles of large animal emergency medicine and surgery as well as the daily management of critically ill equine patients. Students will be involved in a variety of large animal emergency admissions including diagnostic procedures and surgery as well as post-operative or post-admission case management of horses with gastrointestinal disease. Students will attend regular 8 am morning rounds (see course description for Large Animal Surgery, VCSN 800), followed by morning case-based discussion rounds. The day will be spent either on emergency admissions or procedures and management of in-house patients. Daily afternoon rounds will be topic-based, and may be selected from the following topics: Laceration Repair, Emergency Stabilization of Fractures, Abdomen (colic), Diarrhea, Fluid Therapy, Respiratory Distress, Acute Blood Loss/Hemorrhagic Shock, Food Animal Emergencies, Blood Gas Interpretation, Acute Neurologic Patient, Monitoring the Critically Ill Patient, Reproductive Emergencies, Management of Rectal Tears, Critical Care Journal Club. There will be one emergency student assigned to be on-call. On-call shifts are from 6 am to 6 pm (day) and 6 pm to 6 am (night). During the after hours shifts (night and weekends) all emergencies will be received by the emergency student with back up from students in the Medicine and Surgery rotations. During the day time shifts, emergency students will receive equine surgical emergencies and isolation cases. Students will also be assigned treatment duties. Three students will also be required to complete a case-based Grand Rounds presentation of approximately 15 minutes duration. The Emergency / Critical Care faculty and staff will provide primary coverage for the rotation, with assistance from Medicine and Surgery sections.

Taught by: Dr. L. Southwood and Staff
Also Offered As: VCSN 873
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours

VCSN 712 Food Animal Reproduction - NBC
The course is designed for those students anticipating entering large animal or mixed practice. Students will participate in the diagnosis and treatment of clinical reproductive cases in the hospital. Students will be responsible for the daily treatment and examination of all hospitalized cases at the Hofmann Center. Students will also assist in the management of reproductive problems of Widener Hospital patients. Exposure will vary due to fluctuations in case load. Additional ‘hands-on’ practice of reproductive procedures will occur by the use of teaching animals. Organized laboratories will allow the student to become comfortable with diagnostic techniques of large animal species. On-call, weekend, and night duty are required. Students will be required to give a 15 minute presentation during the rotation and prepare two case letters/discharge instructions on animals they evaluated during the rotation. If student interest and time permit, students may go on field trips to breeding farms.

Taught by: Dr. T. Dobbie and Staff
Also Offered As: VCSN 772
Prerequisite: VCSN 644
Activity: Clinical Rotation Dental & Vet school
3.0 Credit Hours
Notes: Satisfies requirement for: EQ, FA, LA. Limitations: 2-6 students/rotation. Priority: FA
VCSN 713 Field Service - NBC
Students in this rotation will assist staff doctors in history taking, physical examinations, and the medical management of patients seen on the Field Service activities of the School's large animal practice. The student is required to attend the appropriate 8:00 a.m. daily rounds at New Bolton Center. The remainder of the day will be spent on field calls. The student will be required to be on night and weekend duty. Night duty will be divided equally among field service students in the rotation. Students on emergency duty are required to be within 15 minutes from New Bolton Center while on duty. Case presentations will be given by students on the second Wednesday of the rotation. Boots and coveralls are essential for this rotation.
Taught by: Dr. B. Smith and Staff
Also Offered As: VCSN 773
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Required: SALA

VCSN 715 Diagnostic Ultrasound in Large Animals - NBC
This rotation will provide students with experience in the diagnosis and treatment of large animal cardiac diseases and the use of M-mode, 2-dimensional real-time, pulsed wave, color flow and continuous wave Doppler echocardiography and exercising electrocardiography. Students will also gain experience in the use of diagnostic ultrasonography in the evaluation of tendon and ligament injuries, diseases of the thorax and abdomen, and the evaluation of masses, swellings, neonates and high-risk pregnancies. Students will also gain experience in patient preparation; obtaining a quality ultrasonographic or echocardiographic image and cardiac Doppler studies; and in interpretation of these images and studies with staff and faculty supervision. Students will be responsible for patient care of animals presented to the Heart Station/Ultrasound Service during the rotation. Prerequisite: Core Medicine and Surgery
Taught by: Dr. V. Reef and Staff
Also Offered As: VCSN 775
Activity: Clinical Rotation Dental & Vet school
5.0 Credit Hours
Notes: Limitations: 2 students/week in VCSN 776, VCSN 775 combined. Satisfies imaging requirement: EQ, FA, LA. Satisfies cardiology requirement: SALA. Notes: Not offered during VCSN 812,872 Sports Medicine/Imaging

VCSN 716 Ultrasonography in Large Animals - NBC
For full course description see VCSN 715. Prerequisite: Core Medicine and Surgery
Taught by: Dr. V. Reef and Staff
Also Offered As: VCSN 776
Activity: Clinical Rotation Dental & Vet school
2.0 Credit Hours
Notes: Limitations: 2 students/week in VCSN 106,776, VCSN 715,775 combined. Satisfies requirement for: EQ, FA, LA. Note: Not offered during VCSN 812,872 Sports Medicine/Imaging

VCSN 770 Large Animal Medicine -Foundation - NBC
Students in this rotation will assist clinicians in history taking, examinations and the medical management of large animal patients presented to the hospital at New Bolton Center. Students will participate in daily ward and Medicine teaching rounds, Radiology rounds and Pathology rounds. All students, whether in core or elective, will be expected to participate in night and weekend duty on a rotating basis. All students will prepare and present one clinical case discussion for Grand Rounds. Time commitment: at least 8 hours per day plus night and weekend duty.
Taught by: Dr. R. Sweeney and Staff
Also Offered As: VCSN 700
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Limitations: Based on Hospital Needs

VCSN 772 Food Animal Reproduction - NBC
The course is designed for those students anticipating entering large animal or mixed practice. Students will participate in the diagnosis and treatment of clinical reproductive cases in the hospital. Students will be responsible for the daily treatment and examination of all hospitalized cases at the Hofmann Center. Students will also assist in the management of reproductive problems of Widener Hospital patients. Exposure will vary due to fluctuations in case load. Additional ‘hands-on’ practice of reproductive procedures will occur by the use of teaching animals. Organized laboratories will allow the student to become comfortable with diagnostic techniques of large animal species. On-call, weekend, and night duty are required. Students will be required to give a 15 minute presentation during the rotation and prepare two case letters/discharge instructions on animals they evaluated during the rotation. If student interest and time permit, students may go on field trips to breeding farms.
Taught by: Dr. T. Dobbie and Staff
Also Offered As: VCSN 712
Prerequisite: VCSN 644
Activity: Clinical Rotation Dental & Vet school
3.0 Credit Hours
Notes: Limitations: 2-6 students/rotation. Priority: FA

VCSN 773 Field Service - NBC
Students in this rotation will assist staff doctors in history taking, physical examinations, and the medical management of patients seen on the Field Service activities of the School's large animal practice. The student is required to attend the appropriate 8:00 a.m. daily rounds at New Bolton Center. The remainder of the day will be spent on field calls. The student will be required to be on night and weekend duty. Night duty will be divided equally among field service students in the rotation. Students on emergency duty are required to be within 15 minutes from New Bolton Center while on duty. Case presentations will be given by students on the second Wednesday of the rotation. Boots and coveralls are essential for this rotation.
Taught by: Dr. B. Smith and Staff
Also Offered As: VCSN 713
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Limitations: Based on Hospital Needs
VCSN 774 Large Animal Clinical Reproduction - NBC
The course is designed for those students anticipating entering large animal or mixed practice. Students will participate in the diagnosis and treatment of clinical reproductive cases in the hospital. Students will be responsible for the daily treatment and examination of all hospitalized cases at the Hofmann Center. Students will also assist in the management of reproductive problems of Widener Hospital patients. Exposure will vary due to fluctuations in case load. Additional ‘hands-on’ practice of reproductive procedures will occur by the use of teaching animals. Organized laboratories will allow the student to become comfortable with diagnostic techniques of large animal species. On-call, weekend, and night duty are required. Students will be required to give a 15 minute presentation during the rotation and prepare two case letters/discharge instructions on animals they evaluated during the rotation. If student interest and time permit, students may go on field trips to breeding farms.
Taught by: Dr. P. Sertich and Staff
Prerequisite: VCSN 644
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Limitations: 2-5 students/rotation. Priority: EQ, FA, LA Majors

VCSN 775 Diagnostic Ultrasound in Large Animals - NBC
This rotation will provide students with experience in the diagnosis and treatment of large animal cardiac diseases and the use of M-mode, 2-dimensional real-time, pulsed wave, color flow and continuous wave Doppler echocardiography and exercising electrocardiography. Students will also gain experience in the use of diagnostic ultrasonography in the evaluation of tendon and ligament injuries, diseases of the thorax and abdomen, and the evaluation of masses, swellings, neonates and high-risk pregnancies. Students will also gain experience in patient preparation; obtaining a quality ultrasonographic or echocardiographic image and cardiac Doppler studies; and in interpretation of these images and studies with staff and faculty supervision. Students will be responsible for patient care of animals presented to the Heart Station/Ultrasound Service during the rotation. Prerequisite: Core Medicine and Surgery
Taught by: Dr. V. Reef and Staff
Also Offered As: VCSN 715
Activity: Clinical Rotation Dental & Vet school
5.0 Credit Hours
Notes: Limitations: 2 students/week in VCSN 776,VCSN 775 combined.
Note: Not offered during VCSN 872 Sports Medicine/Imaging

VCSN 776 Ultrasonography in Large Animals - NBC
For full course description see VCSN 715. Prerequisite: Core Medicine and Surgery
Taught by: Dr. V. Reef and Staff
Also Offered As: VCSN 716
Activity: Clinical Rotation Dental & Vet school
2.0 Credit Hours
Notes: Limitations: 2 students/week in VCSN 776, VCSN 775 combined.
Note: Not offered during VCSN 872 Sports Medicine/Imaging

VCSN 777 Large Animal Neonatal Intensive Care Rotation - NBC
This elective provides students with experience in the management of critically ill large animal neonates and dams with periparturient complications. Daily rounds emphasize the use of monitoring techniques (e.g. capnography, ECG, BP monitor, fetal and neonatal ultrasonography), and various treatment modalities (e.g. parenteral nutrition, positive pressure ventilation, and fluid therapy) required in the management of critically ill neonatal foals and late-term pregnant mares. Students will have the opportunity to master the following manual and theoretical skills: arterial puncture and arterial blood gas analysis, calculation and application of parenteral and enteral nutrition formulations, catheterization techniques for veins and bladder, principles of fluid therapy as applied to patients with septic shock and patients requiring maintenance fluids, radiographic interpretation of neonatal thoracic and musculoskeletal disease, interpretation of fetal and neonatal sonograms, familiarity with different types of respiratory support and resuscitation protocols, and a working knowledge of a wide variety of pharmacologic agents including antibiotics, anticonvulsives, sedatives, analgesics, pressors and inotropic agents. Student responsibilities include presentation of NICU cases at rounds, performing patient treatments with assistance from the NICU nursing staff, morning SOAPs on all assigned cases, and assistance with the diagnosis, treatment and monitoring of neonates admitted to the NICU during their shifts, and assistance with monitoring and parturition in pregnant dams.
Students are scheduled to assist with treatments in the intensive care unit every evening from 6 p.m. to 12 midnight and 6 a.m. to 12 midnight on weekends. Emergency duty is assigned equitably among the students on the rotation. Care of the NICU case population is a team effort shared by fourth year students, NICU clinicians, nursing staff, and foal sitters (second year students and volunteers).
Taught by: Dr. J. Palmer and Staff
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Limitations: 4 students min; 8 students maximum

VCSN 778 Equine Welfare Clinical Elective
This 2-week clinical elective would be open to all fourth year veterinary students, and would be offered once per year, in rotation 1. The enrollment limit is 6 students, and is limited to students who have taken either of the two welfare courses (Applied Animal Welfare and Behavior, Dr. Parsons; Animal Welfare Science, Dr. Pierdon), and then to equine majors if there are any remaining places. Course goals: To provide a comprehensive and nuanced examination of the issues and concerns regarding equine welfare in the US.
Taught by: Rose Nolen-Walston
Activity: Clinical Rotation Dental & Vet school
5.0 Credit Hours

VCSN 780 Ration Evaluation and Formulation - NBC
This course is intended to provide students with practical experience in evaluating dairy feeding programs and formulation of rations. Students will visit dairy farms, inspect feed storage and delivery systems, obtain representative samples of feedstuffs for analysis, examine production records, and assess animal body condition. Students will then evaluate the nutritional and economic adequacy of the whole feeding program, suggest recommendations for its improvement and prepare producer reports for discussion with faculty prior to implementation.
Taught by: Dr. L. Baker and Staff
Prerequisite: VCSN 642
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Limitations: Minimum of 3 students
**VCSN 800 Large Animal Surgery-Foundation - NBC**

Students rotating through Large Animal Surgery at NBC will participate in all aspects of examination and diagnosis, including lameness evaluation and endoscopy, medical and surgical treatment and daily patient care of large animals. During one week of the two-week rotation, each student will be assigned to treat cattle, other domestic farm animals and horses, and during the other week, horses only. Night, weekend and holiday assignments, including treatments and emergency service, will be made according to the requirements of the overall hospital operation during a given session. Students usually are exposed to various surgical procedures (general soft tissue, abdominal, orthopedic, etc.) during any one rotation. During the rotation, students may gain experience with horses being examined on the High Speed Treadmill or undergoing imaging in the Nuclear Scintigraphy Unit. Students will also participate in a variety of didactic teaching rounds, barn rounds and teaching laboratories as described: Monday, Tuesday, Wednesday, Friday 4-5 pm - Surgery Teaching Rounds. Thursday 3-5 pm - Surgery Teaching Laboratory (Wet labs). Monday 8-9 am Radiology Rounds (case-based discussion led by surgery faculty). Tuesday 8-9 am - Lameness Rounds (case-based discussion led by Sports Medicine faculty). Wednesday 8-9 am - Radiology Rounds (case-based discussion led by radiology faculty). Thursday 8-9 am - Grand Rounds (Student case presentations). Friday 8-9 am - Medicine Teaching Rounds (case-based discussion with Medicine faculty and house officers). Nursing staff performs treatments between 9am and 5pm, Monday through Friday and 6pm to 6am Monday through Thursday to allow daily student participation in surgical cases. On Fridays, students perform treatments 6am - 8am, at 6 pm and midnight. On Saturdays, students do treatments from 6am through midnight and on Sundays, from 6am through 10pm. On the last day of a rotation, students do midnight treatments. To facilitate a smooth transition to your next rotation, nursing does 6am and 9am treatments on the first day of each new rotation.

Taught by: Dr. D. Richardson and Staff
Also Offered As: VCSN 870
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours

**VCSN 812 Sports Medicine/Imaging - NBC**

Goals of this rotation are to provide the students with the opportunity to obtain diagnostic skills through the use of different modalities and to incorporate these techniques into the decision-making process during the diagnosis and treatment of horses with performance problems. Students in this rotation will take more responsibility for their cases and follow them through the different specialties without being drawn away to the next case in their assigned area. Each student will spend his/her time in the following areas: 1 week - Ultrasound/Cardiology. 1 week - Nuclear Scintigraphy/Radiology/MRI. 1 week - Treadmill/Podology. 1 week - Poor performance clinic (lameness) Students will be responsible for in house patient care of their designated area plus weekends. All students attend daily afternoon rounds, which demonstrate the concepts behind the different diagnostic techniques and allow students hands on experience so they can be more involved in the clinical cases over the period of the rotation. In the last week the students will each be responsible for an oral presentation of a case on which they have worked during the rotation.

Taught by: Dr. E. Davidson and Staff
Also Offered As: VCSN 872
Prerequisite: VCSN 649 AND VCSN 646
Activity: Clinical Rotation Dental & Vet school
10.0 Credit Hours

Notes: Limitations: Maximum of 4 students per rotation Notes: Offered Rotations 1-8, possibly 9-10; Individual rotations in Sports Medicine Clinic, LA Radiology, LA Ultrasound and Podology are not offered during this time period. Satisfies imaging requirement: EQ, LA, FA

**VCSN 814 Large Animal Radiology - NBC**

In this rotation, students will gain experience in making and interpreting large animal radiographic examinations. They will assist the radiology technicians in taking and processing routine radiographs, attend film reading sessions, daily hospital rounds and review large animal radiographs independently and under supervision. Students will be required to write radiology reports.

Taught by: Dr. K. Wulster and Staff
Also Offered As: VCSN 874
Prerequisite: VCSN 649
Activity: Clinical Rotation Dental & Vet school
5.0 Credit Hours

Notes: Limitations: 2 students/rotation. Satisfies imaging requirement: EQ, FA, LA, SALA. Note: Not offered during VCSN 812,872 Sports Medicine/Imaging
VCSN 815 Large Animal Anesthesiology Service - NBC
During the Large Animal Anesthesia Service Rotation, students will gain experience in: (1) anesthetizing equine and other farm animal patients for elective and emergency procedures; (2) alleviating pain in animals; (3) maintaining adequate vital functions during anesthesia and (4) managing fluid, electrolyte and acid-base disturbances in the perioperative period. In addition, the course offers the opportunity to apply the clinical pharmacology of perianesthetic drugs in various farm animal species. Students are requested to attend Anesthesia Service rounds on Mondays and Fridays (8-9:00 am) during their clinical rotation, which will also offer the opportunity to discuss anesthesia cases. Night and weekend emergency duty is mandatory and shared with veterinary technician students. The maximum emergency duty is 4 weekday nights and one 24-hour weekend day. Students are expected to report to the Sports Medicine Conference Room or Anesthesia Office promptly at 8:00 am on the first Monday morning of the 2-week rotation with scrubs, stethoscope and calculator. Students are requested to review the information contained in the class notes of the following courses for appropriate sections prior to entering the rotation: General Pharmacology and Toxicology (VBMS 607), Animal Physiology (VBMS 606), Anesthesia (VSUR 604), and the Equine and Farm Animal Anesthesia Elective (VCSN 635). Students should also be familiar with dosages of commonly used drugs and their clinical pharmacology and technical aspects of the practice of large animal anesthesia. Students may consult the learn.vet web site to find out more about Student Evaluation & Clinical Skill Assessment in this rotation. Suggested texts: Muir, W.W., Hubbel, JAE. (eds) Equine Anesthesia: Monitoring and Emergency Therapy, 2nd edn, Saunders Elsevier, St. Louis, 2009; Tranquili, W.J., Thurmon, J.C., Grimm, K.A. (Eds) Lumb and Jones Veterinary Anesthesia, 4th edn, Blackwell, Ames, 2007; Doherty, T., Valverde, A. (Eds.) Manual of Equine Anesthesia and Analgesia, Blackwell, Ames, 2006.
Taught by: Dr. B. Driessen and Staff
Also Offered As: VCSN 875
Prerequisite: VCSN 635
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Limitations: 2 students/rotation, not Early Entry. Required: EQ. Satisfies anesthesia/pain management requirement: FA, LA, SALA

VCSN 816 Food Animal Anesthesiology Service - NBC
In this rotation, students will gain experience in planning and performing sedation and anesthesia in small ruminants, swine and camels. Specific clinical objectives during the five-day rotation include physical and chemical restraint, regional and general anesthesia techniques in various food and fiber producing animals, and operation and use of various anesthetic monitoring devices. Emphasis is on techniques and drugs commonly used in the field. Students will formulate plans for sedation and/or short term anesthesia in sheep/goats, pigs and camels and will then carry them out on teaching animals. Techniques for regional anesthesia for flank surgery in the bovine will be performed at Marshak Dairy.
Taught by: Dr. K. Olson and Staff
Also Offered As: VCSN 876
Activity: Clinical Rotation Dental & Vet school
3.0 Credit Hours
Notes: Limitations: 2-4 students/rotation, not Early Entry. Priority: Food Animal Majors. Satisfies anesthesia/pain management requirement: FA, LA

VCSN 870 Large Animal Surgery-Foundation - NBC
Students rotating through Large Animal Surgery at NBC will participate in all aspects of examination and diagnosis, including lameness evaluation and endoscopy, medical and surgical treatment and daily patient care of large animals. During one week of the two-week rotation, each student will be assigned to treat cattle, other domestic farm animals and horses, and during the other week, horses only. Night, weekend and holiday assignments, including treatments and emergency service, will be made according to the requirements of the overall hospital operation during a given session. Students usually are exposed to various surgical procedures (general soft tissue, abdominal, orthopedic, etc.) during any one rotation. During the rotation, students may gain experience with horses being examined on the High Speed Treadmill or undergoing imaging in the Nuclear Scintigraphy Unit. Students will also participate in a variety of didactic teaching rounds, barn rounds and teaching laboratories as described: Monday, Tuesday, Wednesday, Friday 4-5 pm - Surgery Teaching Rounds. Thursday 3-5 pm - Surgery Teaching Laboratory (Wet labs). Monday 8-9 am Radiology Rounds (case-based discussion led by s surgery faculty). Tuesday 8-9 am - Lameness Rounds (case-based discussion led by Sports Medicine faculty). Wednesday 8-9 am - Radiology Rounds (case-based discussion led by radiology faculty). Thursday 8-9 am - Grand Rounds (Student case presentations). Friday 8-9 am - Medicine Teaching Rounds (case-based discussion with Medicine faculty and house officers). Nursing staff performs treatments between 9am and 5pm, Monday through Friday and 6pm to 6am Monday through Thursday to allow daily student participation in surgical cases. On Fridays, students perform treatments 6am - 8am, at 6 pm and midnight. On Saturdays, students do treatments from 6am through midnight and on Sundays, from 6am through 10pm. On the last day of a rotation, students do midnight treatments. To facilitate a smooth transition to your next rotation, nursing does 6am and 6am treatments on the first day of each new rotation.
Taught by: Dr. D. Richardson and Staff
Also Offered As: VCSN 800
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Limitations: Based on Hospital Needs. Note: This rotation is a postrequisite of VCSN645 Large Animal Surgery and Surgical Exercises

VCSN 871 Equine Surgery Clinic - NBC
This elective is specifically designed to provide students interested in equine practice after graduation with additional exposure to a variety of orthopedic and soft tissue surgical problems of horses. Students will actively participate in all aspects of lameness and soft tissue diagnosis, treatment, surgery and patient care. Teaching rounds will involve daily barn rounds, daily didactic presentations and/or wet labs covering surgical topics. Laboratories include internal fixation of fractures, wound repair, arthroscopy, intestinal surgical techniques, laser surgery, head and neck surgery, video analysis of lameness and field anesthesia. Every effort is made to have students in this course perform field castrations with local veterinarians. Students will be expected to participate in after-hours treatments and surgical emergencies of horses; however, students will not be assigned to food animal patients during this rotation.
Taught by: Dr. D. Richardson and Staff
Prerequisite: VCSN 800
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Limitations: 6-10 students. Priority: Equine Majors
VCSN 872 Sports Medicine/Imaging - NBC
Goals of this rotation are to provide the students with the opportunity to obtain diagnostic skills through the use of different modalities and to incorporate these techniques into the decision-making process during the diagnosis and treatment of horses with performance problems. Students in this rotation will take more responsibility for their cases and follow them through the different specialties without being drawn away to the next case in their assigned area. Each student will spend his/her time in the following areas: 1 week - Ultrasound/Cardiology. 1 week - Nuclear Scintigraphy/Radiology/MRI. 1 week - Treadmill/Podology. 1 week - Poor performance clinic (lameness) Students will be responsible for in house patient care of their designated area plus weekends. All students attend daily afternoon rounds, which demonstrate the concepts behind the different diagnostic techniques and allow students hands on experience so they can be more involved in the clinical cases over the period of the rotation. In the last week the students will each be responsible for an oral presentation of a case on which they have worked during the rotation. Taught by: Dr. E. Davidson and Staff
Also Offered As: VCSN 812
Prerequisite: VCSN 649 AND VCSN 646
Activity: Clinical Rotation Dental & Vet school
10.0 Credit Hours
Notes: Limitations: Maximum of 4 students per rotation Notes: Offered Rotations 1-8, possibly 9-10; Individual rotations in Sports Medicine Clinic, LA Radiology, LA Ultrasound and Podology are not offered during this time period

VCSN 873 Large Animal Emergency/Critical Care - Foundation Rotation - NBC
This rotation is designed to teach students basic principles of large animal emergency medicine and surgery as well as the daily management of critically ill equine patients. Students will be involved in a variety of large animal emergency admissions including diagnostic procedures and surgery as well as post-operative or post-admission case management of horses with gastrointestinal disease. Students will attend regular 8 am morning rounds (see course description for Large Animal Surgery, VCSN 800), followed by morning case-based discussion rounds. The day will be spent either on emergency admissions or procedures and management of in-house patients. Daily afternoon rounds will be topic-based, and may be selected from the following topics: Laceration Repair, Emergency Stabilization of Fractures, Acute Abdomen (colic), Diarrhea, Fluid Therapy, Respiratory Distress, Acute Blood Loss/Hemorrhagic Shock, Food Animal Emergencies, Blood Gas Interpretation, Acute Neurologic Patient, Monitoring the Critically Ill Patient, Reproductive Emergencies, Management of Rectal Tears, Critical Care Journal Club. There will be one emergency student assigned to be on-call. On-call shifts are from 6 am to 6 pm (day) and 6 pm to 6 am (night). During the after hours shifts (night and weekends) all emergencies will be received by the emergency student with back up from students in the Medicine and Surgery rotations. During the day time shifts, emergency students will receive equine surgical emergencies and isolation cases. Students will also be assigned treatment duties. Three students will also be required to complete a case-based Grand Rounds presentation of approximately 15 minutes duration. The Emergency / Critical Care faculty and staff will provide primary coverage for the rotation, with assistance from Medicine and Surgery sections. Taught by: Dr. L. Southwood and Staff
Also Offered As: VCSN 701
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours

VCSN 874 Large Animal Radiology - NBC
In this rotation, students will gain experience in making and interpreting large animal radiographic examinations. They will assist the radiology technicians in taking and processing routine radiographs, attend film reading sessions, daily hospital rounds and review large animal radiographs independently and under supervision. Students will be required to write radiology reports. Taught by: Dr. K. Wulster and Staff
Also Offered As: VCSN 814
Prerequisite: VCSN 649
Activity: Clinical Rotation Dental & Vet school
5.0 Credit Hours
Notes: Limitations: 2 students/rotation. Note: Not offered during VCSN 812,872 SportsMedicine/Imaging

VCSN 875 Large Animal Anesthesiology Service - NBC
During the Large Animal Anesthesia Service Rotation, students will gain experience in: (1) anesthetizing equine and other farm animal patients for elective and emergency procedures; (2) alleviating pain in animals; (3) maintaining adequate vital functions during anesthesia and (4) managing fluid, electrolyte and acid-base disturbances in the perioperative period. In addition, the course offers the opportunity to apply the clinical pharmacology of perianesthetic drugs in various farm animal species. Students are requested to attend Anesthesia Service rounds on Mondays and Fridays (8:00 am) during their clinical rotation, which will also offer the opportunity to discuss anesthesia cases. Night and weekend emergency duty is mandatory and shared with veterinary technician students. The maximum emergency duty is 4 weekday nights and one 24-hour weekend day. Students are expected to report to the Sports Medicine Conference Room or Anesthesia Office promptly at 8:00 am on the first Monday morning of the 2-week rotation with scrubs, stethoscope and calculator. Students are requested to review the information contained in the class notes of the following courses for appropriate sections prior to entering the rotation: General Pharmacology and Toxicology (VBMS 607), Animal Physiology (VBMS 606), Anesthesia (VSUR 604), and the Equine and Farm Animal Anesthesia Elective (VCSN 635). Students should also be familiar with dosages of commonly used drugs and their clinical pharmacology and technical aspects of the practice of large animal anesthesia. Students may consult the learn.vet web site to find out more about Student Evaluation & Clinical Skill Assessment in this rotation. Suggested texts: Muir, W.W., Hubbel, JAE. (eds) Equine Anesthesia: Monitoring and Emergency Therapy, 2nd edn, Saunders Elsevier, St. Louis, 2009; Tranquili, W.J.,Thurmont, J.C., Grimm, K.A. (Eds) Lumb and Jones Veterinary Anesthesia, 4th edn, Blackwell, Ames, 2007; Doherty, T., Valverde, A. (Eds.) Manual of Equine Anesthesia and Analgesia, Blackwell, Ames, 2006. Taught by: Dr. B. Driessen and Staff
Also Offered As: VCSN 814
Prerequisite: VCSN 649
Activity: Clinical Rotation Dental & Vet school
5.0 Credit Hours
Notes: Limitations: 2 students/rotation. Note: Not offered during VCSN 812,872 SportsMedicine/Imaging

VCSN 876 Large Animal Surgery - NBC
Prerequisite: VCSN 649
Also Offered As: VCSN 814
Activity: Clinical Rotation Dental & Vet school
5.0 Credit Hours
Notes: Limitations: Maximum of 4 students per rotation

VCSN 877 Large Animal Surgery Service - NBC
This rotation is designed to teach students basic principles of large animal surgery as well as the daily management of critically ill equine patients. Students will be involved in a variety of large animal surgical procedures and surgery as well as post-operative or post-admission case management of horses with gastrointestinal disease. Students will attend regular 8 am morning rounds (see course description for Large Animal Surgery, VCSN 800), followed by morning case-based discussion rounds. The day will be spent either on emergency admissions or procedures and management of in-house patients. Daily afternoon rounds will be topic-based, and may be selected from the following topics: Laceration Repair, Emergency Stabilization of Fractures, Acute Abdomen (colic), Diarrhea, Fluid Therapy, Respiratory Distress, Acute Blood Loss/Hemorrhagic Shock, Food Animal Emergencies, Blood Gas Interpretation, Acute Neurologic Patient, Monitoring the Critically Ill Patient, Reproductive Emergencies, Management of Rectal Tears, Critical Care Journal Club. There will be one emergency student assigned to be on-call. On-call shifts are from 6 am to 6 pm (day) and 6 pm to 6 am (night). During the after hours shifts (night and weekends) all emergencies will be received by the emergency student with back up from students in the Medicine and Surgery rotations. During the day time shifts, emergency students will receive equine surgical emergencies and isolation cases. Students will also be assigned treatment duties. Three students will also be required to complete a case-based Grand Rounds presentation of approximately 15 minutes duration. The Emergency / Critical Care faculty and staff will provide primary coverage for the rotation, with assistance from Medicine and Surgery sections. Taught by: Dr. L. Southwood and Staff
Also Offered As: VCSN 701
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Limitations: 2 students/rotation, not Early Entry

VCSN 878 Veterinary Clinical Studies - New Bolton Center (VCSN)
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VCSN 876 Food Animal Anesthesiology Service - NBC
In this rotation, students will gain experience in planning and performing sedation and anesthesia in small ruminants, swine and camelids. Specific clinical objectives during the five-day rotation include physical and chemical restraint, regional and general anesthesia techniques in various food and fiber producing animals, and operation and use of various anesthetic monitoring devices. Emphasis is on techniques and drugs commonly used in the field. Students will formulate plans for sedation and/or short term anesthesia in sheep/goats, pigs and camelids and will then carry them out on teaching animals. Techniques for regional anesthesia for flank surgery in the bovine will be performed at Marshak Dairy.

Taught by: Dr. K. Olson and Staff
Also Offered As: VCSN 816
Activity: Clinical Rotation Dental & Vet school
3.0 Credit Hours
Notes: Limitations: 2-4 students/rotation, not Early Entry. Priority: FA Majors

VCSN 877 Food Animal Medicine and Surgery Clinic - NBC
This elective rotation is designed to provide additional experience in food animal medicine and surgery to students who are likely to pursue bovine practice following graduation. Students will participate in the diagnosis and treatment of food animal (primarily dairy cattle) medical and surgical diseases. Teaching rounds will involve daily barn rounds, didactic presentations and wet labs covering medical and surgical topics. The emphasis will be on individual animal (as opposed to herd health) problems. Students will be responsible for after-hours treatments and emergencies of food animals only; students will not work with equine patients during this rotation. Each student will have three weeknights and one 24-hour weekend shift during the rotation (based on 8 students enrolled). Note: students that desire further experience in medical or surgical problems of all large animal species should elect either VCSN 770 or VCSN 870.

Taught by: Dr. R. Sweeney and Staff
Prerequisites: Large Animal Medicine and Surgery Rotations. Additional prerequisites for non-food animal majors: VCSN 640 Large Animal Medicine, VCSN 645 Large Animal Surgery and Surgical Exercises, and VCSN 644 Large Animal Reproduction
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Limitations: Maximum of 8 students, not Early Entry Priority: FA majors. First priority to students who are taking VCSN 810,880 Dairy Production Medicine Clinic

VCSN 878 Sports Medicine Clinic - NBC
The Sports Medicine Clinic provides exposure to many types of problems facing the equine practitioner, concentrating on lameness and performance evaluations. While part of the course stresses traditional lameness evaluation and clinical diagnoses, high-speed treadmill evaluations and nuclear scintigraphy enable the student to participate in more intricate problems affecting sport horses. The course will provide students with the opportunity to develop techniques of examination and diagnosis, and permit direct contact with clients. Students are expected to perform in all areas and participate to the maximum of their ability. Duties may include care and SOAPs of in patients and may include care over a weekend. There is NO emergency duty. In order to participate students are required to have satisfactorily completed the prerequisite courses.

Taught by: Dr. E. Davidson and Staff
Prerequisite: VCSN 646 AND VCSN 649
Activity: Clinical Rotation Dental & Vet school
5.0 Credit Hours
Notes: Limitations: 2 students/rotation. Notes: Not offered during VCSN 812,872 Sports Medicine/Imaging

VCSN 879 Equine Podology - NBC
This course covers the principles of both normal and corrective shoeing as well as examining the current theories of hoofcare. The student will: attend surgery rounds beginning in radiology each morning; and work with the resident farrier and equine clinicians on the various lameness problems presented to the clinic. Foot anatomy and physiology will be stressed. While the students will not be required or expected to manually make or nail on a shoe, they will be required to participate in and observe the procedures utilized. Procedures expected of Equine veterinarians such as removing shoes and debriding the sole will be covered in detail. Additional specialties such as the application of extensions to foal hooves can be incorporated into the rotation if requested.

Taught by: P. Reilly and Staff
Activity: Clinical Rotation Dental & Vet school
2.0 Credit Hours
Notes: Limitations: 2 students/rotation. Note: Not offered during VCSN 812,872 Sports Medicine/Imaging
VCSN 880 Dairy Production Medicine Clinic - NBC
This program is an integrated curriculum sponsored by the Sections of CAHP Field Service and Reproduction as a part of the Food Animal Majors Program of the School of Veterinary Medicine. Curriculum begins with an overview of the 'Economic Reality' of dairy production progressing through 'Quantitative Skills' - T test, Chi Square, and Proportions; 'Semem Selection' - visit stud, concepts in genetics semen selection and allocation and linear programming approaches; 'Heifer Rearing' - systems view of heifer rearing, evaluation of heifer weight gain and evaluation of heifer reproduction; 'Dairy Herd' - vaccination programs through body condition scoring; 'Milk Quality' - principles of milking machine, procedures evaluation, mastitis control programs, DHIA, SCC monitoring programs, microbiology and quality assurance Reproduction - traditional programs, new programs and evaluation and interpretation of infertility and pregnancy loss; 'Monitoring Reproduction' - current measures, heat detection, breeding intervals, developing a heat detection program; 'Record Systems' - DHIA records, paper records, DAIRY COMP 305 (down loading data); 'Dairy Nutrition' - ration evaluation using Spantan, interaction with reproduction, MUN interpretations; 'Culling' - basic economic concepts and sample applications; 'Facilities Evaluation' - ventilation and free stalls; 'Computer Data Bases' - DairyL, AABPL, Merck Diagnostic Program, Cornell Diagnostic Program and Internet sites; 'Laboratories' - obstetrics/fetotomy, special procedures, follow the estrus cycle in a cow (2 students/cow), milk progesterone kits and breeding soundness examination; 'Herds visits with private practitioners' Students will spend 2 weeks with private practitioners participating in on-farm investigations.
Taught by: Dr. D. Galligan, M. Kristula and Staff
Activity: Clinical Rotation Dental & Vet school
24.0 Credit Hours
Notes: Limitations: 10 students. Priority: FA Majors

VCSN 881 Food Safety and Quality Assurance - NBC
The purpose of this course is to prepare the student to: 1) Identify human health hazards in food of animal origin. 2) Define some of the roles of the veterinarian in preventing/reducing the introduction of biohazards into the food chain. 3) Discuss the principles of safe food practices for both animals and humans. 4) Recognize and describe where laboratory studies (microbiology, toxicology, chemistry) would help define real or potential problems. 5) Define the appropriate times to utilize laboratory evaluations and become familiar with interpretive criteria. 6) Participate in field trips to learn about different practices and processes. Assess sites in terms of HACCP criteria. 7) Interact with representatives from local and federal agencies concerning policies, application of technology and recommendations concerning problem solving issues. 8) Discuss intervention actions that can be initiated during acts of bioagroterrorism and/or naturally-occurring disasters (using recent events as models for discussion). Case studies will be introduced as problem solving activities.
Taught by: Dr. C. Benson and Staff
Activity: Clinical Rotation Dental & Vet school
5.0 Credit Hours
Notes: Limitations: Maximum of 10 Students. NOT OFFERED UNTIL FURTHER NOTICE

VCSN 882 Swine Production Medicine - NBC
On-farm problem solving and client communications will be emphasized in this course. Students will be required to interact with producers. Students will write a follow-up report describing the findings and recommendations from the farm visit. Each student will also be assigned a case that will require collation of careful history taking, judicious performance of diagnostic tests and critical analysis of computerized production records to reach their diagnosis. Students will visit farms and other allied industries to survey production systems and collect data to be analyzed in the course. Various production systems and cycles will be reviewed, performance targets will be explained, and their elasticity and economic prioritization will be discussed. Records and data will be analyzed and students will learn how to identify significant production deficiencies and associate these with disease processes - either non-infectious, management-related, or infectious. Strategies for dealing with specific deficiencies will be outlined and the benefits of intervening to improve productivity will be compared to the costs of disease and used in developing a recommendation for action by the producer.
Taught by: Dr. M. Pierdon and Staff
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Limitations: 2-6 students. Note: Students are required to have no other contact with swine for the duration of the course

VCSN 883 Advanced Swine Production Medicine - NBC
A new role for swine veterinarians is emerging in large scale swine production. So-called 'corporate veterinarians' are employed by a single company and have the challenge of overseeing the production and health care concerns of the animals owned or managed by their employer. This course provides students with the opportunity to gain exposure to this emerging discipline in swine veterinary medicine. Principles of epidemiology, economics and health care delivery systems and their application to optimizing swine health and production will be provided. Students will work closely with selected professionals who are in a leading role in defining the veterinarians place in large scale, vertically integrated swine production. This course extends the offerings in VCSN 882. Students will be expected to complete a small project or investigation during their visit.
Taught by: Dr. G. Althouse and Staff
Prerequisite: VCSN 882
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Note: Students are required to have no other contact with swine for the duration of the course

VCSN 884 Swine Production - NBC
Veterinarians today cannot make useful contributions to the swine industry without an intimate understanding of swine production. The successful practice of modern swine production medicine depends on the ability of the veterinarian to interweave their traditional training in medicine with the intricacies of swine husbandry. This course provides students with the opportunity to gain hands-on experience in modern swine production systems and/or swine production medicine practices. Students will learn through immersion the basic management, husbandry and/or production medicine practice by working with a practice or a farm in specific phases of swine production at a few selected, nationally recognized swine companies. Permission of instructors required.
Taught by: Dr. G. Althouse and Staff
Prerequisite: VCSN 882
Activity: Clinical Rotation Dental & Vet school
6.0 Credit Hours
Notes: Note: Students are required to have no other contact with swine for the duration of the course
VCSN 885 Equine Ophthalmology - NBC
This course is designed to provide students with ophthalmology experience to supplement what they obtain in the Large Animal Medicine foundation rotation, and, if taken, the Small Animal Ophthalmology elective. It is intended both for students with a special interest in ophthalmology, to broaden their exposure to include equine ophthalmology, and for equine students, to provide them with ophthalmology training that will benefit their equine patients in either general or speciality practice. This latter is particularly important given that most equine students do not take the Small Animal Ophthalmology elective and so graduate without clinical ophthalmology experience. Students will participate in the diagnosis and treatment of clinical ophthalmology cases in the hospital. Students will assist with evaluation of new cases, both inpatient and outpatient, and will be responsible for the daily treatment and examination of all hospitalized ophthalmology cases. Students will handle communication with clients and construct discharge summaries when appropriate. Exposure will vary due to fluctuations in case load. Organized laboratories in slit-lamp biomicroscopy, indirect ophthalmoscopy, and tonometry will allow the student to become comfortable with ophthalmic diagnostic techniques. If time permits, cadaver labs on lid laceration repair, supalpebral lavage placement and enucleation will be available. On-call, weekend, and night duty are required. Students will be required to give a 15 minute presentation during the rotation on a topic relevant to equine ophthalmology, such as corneal stromal abscess, eosinophilic keratitis, equine cataract, equine glaucoma, or Equine Recurrent Uveitis.
Taught by: Dr. N. Scherrer and Staff
Prerequisite: Completion of Large Animal Medicine rotation
Activity: Lecture
6.0 Credit Hours
Notes: Limitations: This rotation offered two times throughout the year, with a maximum of three students per rotation. No minimum. Priority: The course is open to any student wishing to obtain more ophthalmology experience. A lottery may be necessary if interest exceeds availability

VCSN 890 Large Animal Medicine and Surgery Holiday Emergency Rotation - NBC
Students will assist emergency clinicians and house officers in history taking, examinations, and the medical and surgical management of large animal patients presented on an emergency basis to the hospital at New Bolton Center. Students will also be responsible for the care and treatment of medical and surgical patients hospitalized at New Bolton Center. This rotation will consist of two 12-hour shifts per day including the weekends and any holidays (example Christmas and New Years Day). All students will be expected to participate in night, weekend, and holiday duty on a rotating basis. Students in this rotation will be responsible for five 12-hour shifts each during the one-week rotation. Students are expected to be on the premises during their duty shifts. Rounds to acquaint students with the hospitalized patients will be held daily during each shift with the emergency clinician/house officer/nursing staff on duty, but no formal teaching or Grand Rounds will occur during this rotation.
Taught by: Dr. B. Dallap Schaer and Staff
Activity: Clinical Rotation Dental & Vet school
3.0 Credit Hours
Notes: Limitations: preferred minimum 14 students / rotation