

University of Minnesota
College of Veterinary Medicine

Syllabus

CVM 6120 Veterinary Neurobiology

Spring/2011

Two Credits

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Course Description: CVM 6120 Veterinary Neurobiology presents neurohistology, neuroembryology, and the anatomy and physiology of the central nervous system (brain & spinal cord) and special senses (vision, hearing taste, & olfaction) of domestic mammals.

Books and Supplies:

In addition to *CVM 6120 Class Lecture Notes* and the *CVM 6120 Laboratory Manual*, one book is required: "Guide to Dissection of the Dog", by Evans & de Lahunta, 6th edition (previously required for CVM 6100). These may be purchased from the Veterinary Student Supply (651-645-1702; vssvth@umn.edu)

Also, the following textbook resources are available on reserve in the Veterinary Library (the first two books are out of print).

- DeLahunta A: *Veterinary Neuroanatomy and Clinical Neurology* (2008). Because this book is organized somewhat differently than the course, it offers another perspective. A strength of the book is its clinical content which is useful later in the curriculum.

- Jenkins TW: *Functional Mammalian Anatomy* (1978) This text is a nicely organized and offers comprehensive presentation of neuroanatomy.

- Beitz AJ & Fletcher TF: Brain and Spinal Cord chapters in *Anatomy of the Dog* (1993) edited by H. Evans. This text contains more information than you need to know for the course, but it has some nice illustrations.

- Beitz AJ & Fletcher TF: Nervous Tissue in *Textbook of Veterinary Histology* (2006) edited by JA Eurell and BL Frappier; pp 91-116. This textbook chapter offers a comprehensive presentation of neurohistology.

- Any anatomy or physiology text will present nervous system function and structure.

Goals and Objectives -- Knowledge: When the student successfully completes the course, he/she will have developed an understanding of how the nervous system of domestic mammals is organized, in terms of relationships among major components comprising the nervous system, and an appreciation of how behavior is altered by disorders of nervous system components. The student will also learn the basic components and functions of the spinal cord, brain stem, cerebellum and cerebrum. The course is taught to provide a basic understanding of the nervous system, which can be used as a knowledge base for learning more detailed information regarding the physiology, pharmacology and pathology of the nervous system and for understanding clinical diagnosis and treatment that will be taught in later coursework in Veterinary Neurology.

Goals and Objectives – Skills and Abilities: Upon successful completion of the course, students will be able to identify and pronounce the names of nervous system components, to facilitate their understanding of medical literature and communication with medical colleagues. They will be able to explain how neural components are structurally and functionally related to one another and how specific neural damage leads to particular neurological disorders. They will understand the rationale for procedures comprising a neurological exam of a veterinary patient.

Participation Policy: Students are expected to attend class, to read the lecture notes prior to attending lecture and to query instructors about course content that they do not understand. Instructors are available for individual consultation during laboratory periods and at other times by appointment.

Grading and Grading Standards:

Your CVM 6120 letter grade will be based on the following scale (percent total score rounded to the nearest whole number):

- A = 90-100%
- B = 80-89%
- C = 70-79%
- D = 65-69%
- F = below 65%

Examinations:

There will be one major quiz and two examinations in the course. The quiz is worth 10% of the grade, the midterm exam will account for 30% of the grade and the final exam will account for 40% of the grade. In addition students will be expected to read 2 articles during the course that are related to the lecture material. A short 2.5-point quiz will be given in class for each article that is assigned. Thus 5% of the grade will come from these 2 short quizzes (2.5 pts/quiz X 2 quizzes = 5 pts). An additional 5% of the grade will come from a written report based on a clinical case study. The final 10% of the grade will come from in class and out of class assignments. The midterm and final exams will consist of a written test and a lab test (on gross brain and glass slide material). The written and lab exams for the midterm are each worth 15% of the grade and for the final exam they are each worth 20% of the grade. The range of subject matter per exam will be announced in class.

Specifically, on written examinations you will be tested on the information presented in lecture and in the *CVM 6120 Class Lecture Notes*. You will not be tested on the Clinical Correlation session presented by Dr. Hardy. For each lab exam, you will be tested on

underlined/bold terms in the *CVM 6120 Laboratory Manual*, as presented in the accompanying *Neuroanatomy Lab Terms List*.

Questions on written exams may be any of the following types: essay, short answer, multiple choice, T/F, matching. The practical/laboratory part will include identification of brain, spinal cord or special sense organ structures, brain or spinal cord nuclei and fiber tracts and histological structures associated with the brain, spinal cord or special sense organs or questions related to these structures. Laboratory exam questions will be presented using a combination of whole brains, special sense organs and spinal cord specimens as well as histological sections through these structures.

Academic Dishonesty: Students are expected to do their own assigned work. All examinations will be conducted under honor code regulations of the College of Veterinary Medicine and according to CVM academic policies on testing. Students are expected to complete exams in the time allotted.

Make-up Examination Policy: We will follow the examination policy that was approved by the College of Veterinary Medicine on 11/3/05. Students will be automatically excused from an examination in only 2 situations:

- a. Preapproved absence for medical reasons (personal or family). Preapproval requires that the student contact the instructor prior to the test/deadline and provide an explanation of the reason for the absence.
- b. Emergency medical absence (post-test notification) if pre-approval was not possible and proof of medical care is provided.

With the exception of emergency medical problems students must notify the course instructor that they will miss a test or deadline before the test or deadline. Missed examinations must be taken within 3 days of the originally scheduled test, except for adverse circumstances as determined by the Office of Academic and Student Affairs.

Clinical Case Study (5 pts): Students will be divided into groups of 6 students and each group will be assigned a case study. Each student in the group will be assigned a specific topic related to the case study and collectively the 6 topics will be combined into a 4-5 page written report that will be submitted by each group. All members of a group will receive the same grade on the report. More details will be provided in class. The clinical case study will comprise 5% of your grade.

Requirements for the Clinical Case Report for Neurobiology:

1. The text should be double-spaced and the entire report should not exceed 6 pages in length (maximum 1 page per question).
2. References are not required, but could be added as a 7th page if you want to document some of your responses with references from the literature.
3. Recommended format: Type each question (1-6) followed by the answer.
4. Provide enough detail to indicate that you understand the question and to adequately support your answer. You are expected to exercise your neuroanatomy knowledge to locate particular neurological lesions, explaining how you arrived at the location diagnosis by interpreting clinical signs in relation to functions of nervous system components.

Criteria for Evaluation:

Grades will be awarded based on examination scores, performance on quizzes, performance on class assignments and performance on the clinical case study, as described above.

Student Expectations

As a student you will be expected to:

- Attend each class and lab period and develop an understanding of how the nervous system is organized, how it functions and what symptoms animals exhibit following damage to central nervous system components.
- Complete the 2 examinations and the quiz, and show a competent understanding of the material presented.
- Complete all class assignments
- Read the two articles assigned for class reading and take the quiz related to each article.
- Work with your group to complete the clinical case study.
- Complete a course evaluation form at the end of the course.

What You Can Expect from Your Instructors:

You can expect us to:

- plan and facilitate learning opportunities that will help you meet the course goals and objectives
- provide constructive feedback on your performance
- be open to constructive feedback on our performance
- be open-minded in responding to your ideas and suggestions.
- allow you to wrestle with ideas in order to shape your own conclusions
- relate the information to clinical practice as much as possible.

Clickers: We will be using *clickers* in the Veterinary Neurobiology class. You received clickers during Fall semester and we will continue to use them during the Spring semester in several of your courses including Neurobiology. You are responsible for bringing your clicker to each Neurobiology lecture and to the neurobiology lab introduction in room 125. As you know each *clicker* has a specific registration number and a clicker with a specific registration number is assigned to each student. We assume you have already registered your clickers on line at “iclicker.com”. Since the clickers will be used for short quizzes related to the two reading assignments and for the quiz given on January 20th, do not give your *clicker* to another student. You are responsible for returning the *clicker* to VSS at the end of the semester.

Moodle Site: There is a class moodle site that you will have access to. This site will contain an electronic copy of the class syllabus and schedule as well as PDF copies of the class notes and lab manual. Reading assignments will also be posted on the moodle site.

Methods of Instruction:

Lectures will be based on the Lecture Notes that students purchase. Lectures will include additional images, video clips, and limited live animal presentations.

Labs will involve identification of structures observed in gross brains and on tissue glass slides, as described in the Laboratory Guide that students purchase. Lab content will be introduced in a lecture room context at the beginning of each lab. Lab demonstration

material will be displayed during each Lab period for purposes of subject matter clarification and enrichment.

Independent Study. To access web-based courseware, visit the Veterinary Anatomy web site (<http://vanat.cvm.umn.edu/>), which contains a CVM 6120 web page. The following courseware web sites may be viewed on-line or downloaded to your local hard disk.

Courseware Recommendations for CVM 6120 Students — presents courseware available on the Veterinary Anatomy web site in the context of veterinary students studying neurobiology (CVM 6120).

Canine Brain Transections — a web site presenting sixteen transverse sections through a canine brain with dynamic labels depicting structures that students are expected to identify per brain section. Two modes of identification are available: select a name & see the structure or select a structure & see its name.

Brain Gross Anatomy — a web site presenting a variety of gross anatomical images of brains of domestic animals. Images are organized by anatomical region and by viewing perspective. Each image has an accompanying caption. Labels can be toggled on/off.

Neurohistology ATLAS — a web site that presents a variety of neurohistology images with captions. Via two-way links, a catalog of small images is available to locate large images with full captions.

Developmental Anatomy — a Subject Outline and Knowledge Self-Assessment web site that includes the Nervous System (& Special Senses). The Outline of Topics is linked to True/False Questions with Explanations, intended for instruction rather than grading.

Neurobiology Labs: Preview/Review Images — a web site presenting neuroanatomy information related to each of eight Neurobiology Labs. Content in the form of images with captions, including links to other images, is organized per Lab.

Lab I: Neurohistology — a web site that duplicates Lab I of the CVM 6120 Laboratory Guide, presenting color images that correspond to the black & white images included in the Lab Guide. Each section of the Lab Guide is a page in the web site.

Lab 2: Spinal Cord — a web site corresponding to Lab 2 of the CVM 6120 Laboratory Guide dealing with the spinal cord.

Lab 3: Brain — a web site corresponding to Lab 3 of the CVM 6120 Laboratory Guide, including color images of dissected brains.

Lab 4: Cranial Nerves — a web site that relates to Lab 4 of the CVM 6120 Laboratory Guide. It is also a stand-alone graphic tutorial for canine cranial nerves and cranial nerve nuclei, including: cranial nerve attachment sites; fiber-type cell column identification; cranial nerve nuclei in brainstem transverse sections; and cranial nerve nuclei innervation.

Lab 6: Cerebellum — a web site corresponding to Lab 6 of the CVM 6120 Laboratory Guide dealing with the cerebellum.

Cranial Nerve Nuclei - Animated Quizzes — animated quizzes are provided for students to reinforce their knowledge of cranial nerve nuclei with respect to nuclear names, innervation targets, associated cranial nerves, and fiber-type per nucleus.

Diagnose Neurological Lesion Location Exercises — this web site allows students to exercise their neuroanatomy knowledge to locate destructive neurological lesions.

Learning Objects (Animations) — several animations are currently under development to illustrate neurobiology concepts. They will be introduced during the course.

Classroom Policies:

Cell phones. Turn phones, PDAs, and other electronic devices off or switch them to a silent mode during lecture unless directed otherwise; turn such devices off during exams, except in truly extraordinary situations (such as an imminent birth or death).

Academic Problems Related to Veterinary Neurobiology:

This course will present new material (vocabulary and concepts) that many of you are unfamiliar with and thus it may present a challenge to some of you. The course is only 7 weeks long and thus you will be asked to learn a considerable amount of new material in a short period of time. However, one of our goals in this course is to help you succeed. If you encounter academic issues or problems during the Neurobiology course please schedule a meeting with Drs. Beitz or Fletcher to address these issues. You can also receive academic assistance and counseling from the Office of Academic Affairs.

Student Mental Health:

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. University of Minnesota services are available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via the following website: <http://www.mentalhealth.umn.edu/>.

Accommodations for Students With Disabilities: Participants with special needs are strongly encouraged to talk to the instructors as soon as possible to gain maximum access to course information. All discussions will remain confidential.

University policy is to provide, on a flexible and individualized basis, reasonable accommodations to students who have documented disability conditions (e.g., physical, learning, psychiatric, vision, hearing, or systemic) that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities are encouraged to contact Disability Services and their instructors to discuss their individual needs for accommodations. Disability Services is located in Suite 180 McNamara Alumni Center, 200 Oak Street. Staff can be reached at <http://ds.umn.edu> or by calling 612/626-1333 (voice or TTY).

Diversity and Collegiality: Because a key to optimal learning and successful teaching is to hear, analyze, and draw from a diversity of views, the instructors expect collegial and respectful dialogue across disciplinary, cultural, and personal boundaries.

Student Conduct: Instructors are responsible for maintaining order and a positive learning environment in the classroom. Students whose behavior is disruptive either to the instructor or to other students will be asked to leave. Students whose behavior suggests the need for counseling or other assistance may be referred to their college office or University Counseling and Consulting

Services. Students whose behavior may violate the University Student Conduct Code may be referred to the Office of Student Judicial Affairs.

Sexual Harassment: University policy prohibits sexual harassment as defined in the University Policy Statement (<http://www1.umn.edu/regents/policies/humanresources/SexHarassment.html>) adopted on December 11, 1998. Complaints about sexual harassment should be reported to the University Office of Equal Opportunity, 419 Morrill.