

Veterinary Anatomy, VETM*3070
Fall/Winter 2016-2017
2.0 Credits

Calendar Description

An introduction to comparative, topographical anatomy, primarily of 5 domestic mammals: cat, dog, horse, sheep, and cow. Full dissections of these species are related to the living animal and to imaging, to form the basis for future studies in clinical morphology. Students are introduced to the major anatomical systems and to the regions in detail: thorax, abdomen, head and neck, pelvis and perineum, and limbs. Active learning, problem solving, communication skills and the integration of material across concurrent courses are fostered.

Course co-Coordinator

Dr. Jeff Thomason – Systems, Head and Neck and Limbs Instructor

Ext. 54934; Rooms 2604 or 2605-07; E-mail: jthomaso@ovc.uoguelph.ca

Dr. Matt Vickaryous – Pelvis and Perineum Instructor.

Ext. 53871. E-mail: mwickary@uoguelph.ca

Instructors

Dr. Pavneesh Madan – Thorax and Abdomen Instructor

Ext 54480, Room 3605, E-mail: pmadan@uoguelph.ca

Dr. Heather Chalmers – Imaging Instructor and coordinator of the imaging component –

hchalmer@ovc.uoguelph.ca

Dr. Brigitte Brisson – Pre-surgery instructor and coordinator of that component –

bbrisson@uoguelph.ca

Ms. Emily Gilbert – CNS Instructor – gilberte@uoguelph.ca

Mr. Roman Poterski – Lab Instructor, Technician and Preparator.

Ext 54240; Room 1620, rpotersk@uoguelph.ca

Mr. David Robinson, Lab Instructor, Technician and Preparator.

Ext 54240; Room 1620, djrobins@uoguelph.ca

Mr. Josh Antunes – Graduate Teaching Assistant in the Dissection Labs, jantunes@uoguelph.ca

Dr. Shaimaa Abdelmegid – Graduate Teaching Assistant for Live Animal and the Dissection

Labs, sabdelme@uoguelph.ca

Administrative Information

For questions regarding academic consideration, continuation of study, academic misconduct, safety, confidentiality, and experiential learning involving use of animals, please refer to the Phase 1 information on the OVC website.

NOTE: This course has some **60% assessments** (i.e., individual tests or exams for which a minimum mark of 60% is necessary to pass the whole course). Details are given in the **Evaluation** section.

Course Structure and Objectives

Primary Goals

During this course you will achieve an understanding of the functional anatomy of the dog, cat, sheep, horse and cow, and will be able to integrate that knowledge between cadaver material, live animals, and images. You will also learn basic skills to be used later in surgery. All of the material can be used in concurrent and future courses in the basic sciences and clinical studies, and for comparative study of other mammals and vertebrates.

Your learning in this course is organized into 4 components, each of which is presented in a different way, and more-or-less concurrently: (1) [Dissection](#), (2) [Live Animal](#), (3) [Imaging](#), and (4) [Principles of Surgery](#).

Dissection

Objectives for this component

At the end of this course you will be able to:

- Identify a selection of grossly visible anatomical structures (which are named in the course notes and manuals) in five domestic animals: horse, cow, sheep, dog and cat.
- Describe the gross appearance and distribution of each anatomical **System**—nervous, musculoskeletal, alimentary, cardiovascular and lymphatic, genitourinary, and respiratory—and of the endocrine organs and skin and its derivatives (hair, horns, hooves, and claws).
- Identify and describe the detailed anatomy of each **Region** of the body—thorax, abdomen, head and neck, pelvis and perineum and limbs—and the components of each System that are found within them.
- Describe the relationship between structure and function of the alimentary, respiratory, cardiovascular and musculoskeletal organs.
- Use the correct anatomical terminology for directions, planes of the body, and the structures that you have seen.

Presentation

This component nominally consists of 2 lectures and 2 dissection laboratories per week (with considerable variation among weeks).

The order of presentation through the course is largely by body **Region**: (1) Thorax, (2) Abdomen, (3) Head and Neck, (4) Pelvis and Perineum, (5) Hind Limb and (6) Forelimb.

Lab manuals (on Courselink) lead you through the dissections on each region. You will be allowed to focus your dissection on any of the species available, but are responsible for knowing the anatomy of all of them. You are encouraged to teach ‘your’ species to other members of your practice group who choose to work preferentially on other species, and learn from them in turn.

Videos of each lab are also available on Courselink. They show you how to do the dissection, and you are encouraged to view them ahead of time. In case you can’t, we will also show the relevant video at the beginning of each lab.

The lectures will either introduce upcoming dissections, or will describe concepts and **Systems** relevant to the region, and notes on them are on Courselink.

Your electronic schedule will tell you which Region is current, and which lecture or lab within that Region is on a given day.

This material will be tested in the formative *vivas* (oral tests) and December bellringer, and in the bellringer and written parts of the summative Final exam.

Live-Animal

Objectives for this component

At the end of this course you will be able to:

- Describe and identify on a living animal the topographical relationships among organs in the body cavities and the normal changes in these relationships during life.
- Identify visible and palpable landmarks on the live animal of each species, and indicate their relevance to the physical exam.

This component is largely self-taught, and asks you to integrate knowledge gained from the dissection labs with that learned in Clin. Med. 1 on how to do a physical exam.

A Live Animal Manual (on Courselink) lists all of the landmarks/structures we expect you to know and why, and complementary videos show you exactly how and where to find each one.

Independent study time is provided in the electronic schedule for you to combine the live-animal exercises in Clin Med 1 and Anatomy. You will be informed how to book animals for these exercises. You do not necessarily have to use the times indicated – they are in the schedule just to make sure you have time in your day for the exercises.

There are review labs in December and March, for you to verify your knowledge, and the material is tested in stations that are part of the OSCE Final exam in Clin Med 1.

Access to live animals

Students may book time to independently practice in small groups outside of their Phase schedule. Large animal species (cattle, horses, sheep) housed in Barn 37 will be accessible for practice outside of scheduled times only during regular working hours (Monday to Friday, 8am to 4pm), provided that other courses are not using the animals or facility. Prior to large animal use for practice, permission must be obtained from Rob Leighton (rleight@uoguelph.ca), who will specify which animal(s) you may use.

Instructions for recording animal use after you have finished are posted in Barn 37 near each species. Diligent recording of animal use in this manner is essential in order to avoid inadvertent overuse of individual animals, as they are shared between multiple courses.

For safety reasons, you must work together in groups of 3 or more students when practicing with the large animal species. Coveralls and steel-toed footwear are required.

NOTE that the clinical skills building, barn 37, and all teaching horses/cows/sheep will not be available for practice outside of regularly scheduled lab times on the following dates: February 27 to March 3; Friday, March 10; March 13 to 19, and April 7 & 8.

The dogs used in this course are from the University of Guelph Central Animal Facility (CAF). These dogs are accessible for practice outside of laboratory time during CAF regular business hours. Please contact Annette Morrison at CAF (amorriso@uoguelph.ca) to arrange practice times.

Imaging

Objectives for this component

At the end of this course you will be able to:

- Identify various anatomic structures on radiographs and explain the basic principles behind the radiographic appearance of different tissues.
- Explain the safe use of x-rays in veterinary practice
- Describe the principles of use for advanced imaging modalities including ultrasound, CT, MRI and nuclear scintigraphy.

This component of the course allows you to apply your growing knowledge of anatomy to the recognition of structures visible on radiographic images (and perhaps a few from other imaging modalities). The emphasis is on recognition of what you see, not on diagnosis, which will come in later years.

Twelve lectures are scattered throughout the course, first to introduce the principles of imaging, then to lead you through the basic interpretation of images of each region.

Several radiographs (and the occasional CT or MRI scan) will be on display in each gross lab session, to illustrate the region being dissected. Spend a few minutes during each lab to look at them. In addition, there is one imaging lab per semester held in the computer lab in which we will work through clinical cases.

On Courselink, you will find a file called Imaging Question Sheet (under the Imaging module). Print it off and use it to interpret each and every image you see in lab during the year. The same sheet will be used to examine your ability to read previously unseen images during the Imaging part of the Final exam. There will also be some Imaging questions on the Final written exam

Principles of Surgery (POS)

Objective for this component

- To introduce instrument handling and basic suture techniques in preparation for Phase 2 and 3 surgical lectures and training laboratories.

Instruction will consist of 3 formal lectures, self-directed website study (using the roadmap provided in Courselink and the scheduled independent study times), a self-directed suture exercise (using the mastery list provided in Courselink), and 1 practical laboratory session.

This material will be examined in stations that are part of the OSCE Final exam in Clin Med 1.

There will also be some PoS questions on the Final written exam

Evaluation

The philosophy of evaluation in this course follows the formative-summative model, in which midterms are for feedback on your progress, rather than giving many marks, and the real testing and most of the marks come at the end.

Marking Scheme

Midterms (descriptions are on the next page).

<u>Item</u>	<u>Worth %</u>
Mini Quiz (thorax, for feedback only)	0
<i>Viva Voce</i> - oral test in groups (thorax + abdomen, dissection)	2 (OPF)*
<i>Viva Voce</i> - oral test in groups (head and neck)	2 (OPF)*
Bellringer 1 (comprehensive to date) – End of Fall semester	25
<i>Viva Voce</i> - oral test in groups (pelvis)	2 (OPF)*
<i>Viva Voce</i> - oral test in groups (osteology and limbs)	2 (OPF)*
Total of midterm marks	33%

* These midterms are graded as outstanding/pass/fail (OPF). **Outstanding = 2 marks (100%); Pass = 1.2 marks (60%); Fail = .5 mark (25%).** *The aim of all of the vivas is to give you feedback on your progress rather than to contribute greatly to your mark.*

Finals (descriptions are below)

Final lab exam. worth 42%

This will have 4 components:

- Live animal test worth 6% (scheduled in the OSCE for Clin. Med. I)
- PoS test worth 3 % (scheduled in the OSCE for Clin. Med. I)
- Imaging test worth 10% (scheduled in the 1st week of exams)
- Bellringer 2 worth 23% (scheduled in the 1st week of exams)

Final Written combined exam worth 25%

The whole exam will include sections on Anatomy, Histology, and Physiology, all marked separately. The anatomy section contributes only to this course, and has questions from the Dissection, Imaging and PoS components.

Total of Final marks **67%**

The 2 bellringers and final written exam are subject to 60% rules, as follows:

1. The sum of your marks on the 2 bellringers must exceed 60% (i.e., > 28.8 of the maximum of 48 marks). If your marks do not meet this criterion, an incomplete grade will be submitted and remediation will be required. To successfully complete remediation, a mark of **60%** or better must be achieved in a comprehensive *viva voce* at a time to be arranged with the course coordinator. If, after remediation, you still do not have the necessary 60%, you will be considered to have failed to meet this criterion.

2. You must gain 60% or better on the Written anatomy component of the Final exam. If your mark does not meet this criterion, an incomplete grade will be submitted and remediation will be required. Remediation will comprise gaining more than 60% on a similar written exam. If, after remediation, you still do not have the necessary 60%, you will be considered to have failed to meet this criterion.
- If your mark on the December bellringer is <60%, you will be offered optional remediation to be taken within 30 days. If you take up the offer and remediate successfully, you will be considered to have met the 60% plateau for calculating what you need on the final bellringer in April. For example, say you get 50% in December, then without remediation you would need 70% on the final bellringer to average 60%. This need to 20% jump from 1 bellringer to another will be daunting and stressful. After successful remediation, you would only need 60% on the final bellringer. Note that you will retain the original mark for the December bellringer in your grade book, whether or not remediation is successful. Remediation in this case is intended to reduce your stress not to change your mark.
 - If, at the end of the course, your total grade is >50%, but you have missed either or both of criteria 1 and 2, then you will be offered remediation as necessary. If remediation is not successful for either or both criteria, then a course grade of 49 will be submitted and the matter sent for academic review.
 - If, at the end of the course, your total grade is <50%, remediation will not be offered for either the final bellringer or written exam, because it will not improve your grade. You will have failed the course and your grade will be submitted to academic review.

What if I miss a midterm or part of the Final exam? In the event that an assignment is missed for a reason that is recognized as valid by the University and the College, one of the following options will be exercised:

1, Missing a *viva voce*. Inform the instructor as soon as possible. It is *not* necessary to inform Dr. Conlon (unless you miss significant amounts of work in other courses as well). You will get the same mark as your group. On your return you will get the group to quiz you in a similar manner to that of the viva, so you get the benefit of the feedback on how well you are remembering and keeping up with the material;

2, Missing the midterm bellringer. Please consult with Dr. Peter Conlon before coming to Dr. Thomason. A make-up *viva voce* test will be taken within 30 days;

3, Final exams. If any component of the final exams is missed, the matter will be referred to academic review.

Description of midterms and components of the Final Exam

Viva voce: The purpose of the 4 vivas is to reinforce your anatomical knowledge as you gain it by putting it in a mock clinical context, and to give you feedback on how well you know the material. *Viva voce* means ‘live voice,’ and you will have to speak during the test. It will be conducted in lab in your practice groups, and a schedule will be posted. Each viva will require active participation from every member of your practice group in the presence of an instructor, and the first one on the thorax will be a dry run (worth 0%) to show you how the other will work. At the beginning of each region, you will be give brief details of a presenting complaint, e.g. “A dog is brought in with 2cm of a metal bar protruding from its thoracic inlet. You are told that the bar is actually 20cm long.” Your task for the viva is to explore the possible anatomical consequences of the presentation, based on your dissection of that region, and you will expected to show the relevant structures on a dissection as you mention them. What structures could be involved? Where are they located? What are some of the consequences if their function is impaired (yes, you can show off some of your physiological prowess too)? What structures are likely to be spared, and what is

their function? How would this case be different if a ruminant or horse was the affected animal? You will research this ‘case’ in your group out of class time, and come prepared to give a 8-12-minute commentary on it, similar to the way you would present a case in the clinics. Everyone in the group will be expected to contribute to the commentary. The examiner will ask follow-up questions and the whole test will last 25-30 minutes. For our purposes, you will be marked (on a scale of Outstanding—Pass—Fail), on your demonstration of anatomical knowledge and clarity of presentation, rather than clinical skill.

Bellringers: The purpose of the bellringers is to test your detailed anatomical knowledge, and they are sufficiently important to warrant a 60% designation, as described on the previous page. The midterm bellringer in December and the final bellringer in April have very similar formats. Between 55 and 65 stations will be set out (including some rest stops). Each station will have an anatomical structure displayed and tagged, and a card with a multiple-choice question pertaining to the tagged structure. The question may ask you to identify the structure, or give a second level of information (what does it supply with blood or innervate, or what supplies or innervates it?) You will each begin at a different assigned station and answer the questions there. After 90 seconds a buzzer or bell will tell you to move to the next station. This process will repeat until you have seen all of the stations.

Live animal: This component of the final exam is included in the OSCE exam in Clinical Medicine 1, though the marks stay in Anatomy. As part of one station in the Small Animal section of the OSC, the examiner will ask 1-2 questions asking to palpate an anatomical landmark that is included in the Live Animal Manual, and indicates its significance. One station in the Large Animal section will be administered by anatomy instructors, who will ask you to palpate and relate the significance of landmarks on a horse and cow (both!).

Imaging: This is a standalone exam, in the first week of exams, and is held in the Anatomy lab. You will come into the lab with 11 other students and go to a preassigned lightbox carrel, where you will find 1 previously unseen radiograph. You have 12 minutes to answer the questions on the same question sheet that you will use all year to develop a system for assessing radiographs, and relating them to anatomy. After 12 minutes, you’ll go into the museum where an instructor will read your answer and ask you questions on it.

Principles of Surgery: This will be tested at a station in the OSCE exam in Clinical Medicine 1, though the marks stay in Anatomy. Dr. Brisson will clarify the nature of the station early in her sessions with you.

Final written exam: This will include 50-70 multiple choice questions specifically on anatomy, that will occupy part of the Combined written exam. Anything from the course is fair game, with more attention on detail for the Winter material, and more on general concepts for the Fall material. The marks for these questions stay in Anatomy.

Resources

Within-course preparatory materials

- **Lecture Power points, on Courselink.** All instructors post them.
- **Dissection Lab manual.** The several parts are available on Courselink.
 - Option 1: You are welcome to print a copy each.
 - Option 2: Print one copy only and send it to M&T for photocopying for the whole class (the class officers will need to organize this option).
 - Option 3: Find a sponsor to get them printed for you. This has already happened for 2016-2017.
- **Dissection lab videos.** On courselink. Look at them before each dissection lab.
- **Live Animal Lab Manual.** Instructions for the self-directed live animal component
- **Live Animal Videos.** To accompany the manual and to prepare you for conducting your own live animal palpations.

- **Imaging scoresheet.** On Courselink. Use it as you look at any image during the course.
- **POS instruction manual.** On Courselink

Books

- ***Strongly recommended:* Textbook of Veterinary Anatomy. Dyce K.M., Sack W.O. and Wensing C.J.G. *Fourth Edition*, W.B. Saunders, Philadelphia, 2010. Available in OVC bookstore.**
- ***Recommended Atlas: Anatomy of the Domestic Animals. Pasquini, Spurgeon, & Pasquini. 7th edition. SUDZ Publishing. Available in OVC bookstore***

Other resources

- There are many other types of resource available to you — too many to list, with new ones appearing every day.
- Within your group, get in to the Library or search online to see what you can find. Many other veterinary colleges post useful materials that may augment those provided in this course. There are also commercial offerings, such as the Glass Horse.
- If you find something useful, share it with your group or the whole class.
- Be aware that other resources may not use the same system of anatomical names that we do.

Final remarks

This course comprises a considerable amount of self-directed learning and learning that is guided rather than taught in a didactic sense by an instructor. Come prepared to work with your practice group in a collaborative way to proceed actively through the material. Do not be seduced into thinking that this is a traditional course, by the fact that there are defined lectures and labs. Don't assume that the lectures are giving you all the material you have to know, and all you have to do is write it down and learn it. The lectures, the pre-lab videos, the lab manual, and the live animal manual and videos, are all *preparatory* sources of information. If you come prepared to each lab or independent live animal session, you will do most of the learning actively, either hands-on in the lab, or with images during and between classes, or with live animals and suture models. Take charge of your own learning and work with your groupmates, and you will get the most benefit from this course.

Bon voyage from the Anatomy Team. We look forward to sharing your exciting journey.