



EQN*2040 Equine Anatomy and Physiology

Winter 2019

Section(s): C01

Department of Animal Biosciences

Credit Weight: 0.50

Version 1.00 - January 03, 2019

1 Course Details

1.1 Calendar Description

This course examines the gross anatomy and physiology of the horse. All the major body organs will be studied in relation to their function in the equine. Comparative analysis will be made to other domestic farm animals.

Pre-Requisite(s): BIOL*1050

Restriction(s): Registration in BBRM.EQM

1.2 Timetable

Class schedule and location

Lecture Tuesday and Thursday at 8:30 a.m. – 9:50 a.m. in ANNU 030

Lab Section 1 - Monday 2:30 p.m. - 5:20 p.m. ANNU 110

Section 2 - Monday 11:30 a.m. - 2:20 p.m. ANNU 110

1.3 Final Exam

Exam time and location is subject to change. Please see WebAdvisor for the latest information.

2 Instructional Support

2.1 Instructional Support Team

Instructor: Wendy Pearson
Email: wpearson@uoguelph.ca
Telephone: +1-519-824-4120 x53652
Office: ANNU 227
Office Hours: By appointment.

2.2 Teaching Assistant(s)

Teaching Assistant: Jennifer MacNicol
Email: jmacnico@uoguelph.ca
Office: ANNU 217
Office Hours: By appointment.

3 Learning Resources

3.1 Required Resource(s)

Anatomy of the Horse (6th Edition) by Budras, Klaus Dieter, Sack, W.O., Rock, Sabine

Available online at (Textbook)

http://primo.tug-libraries.on.ca/primo_library/libweb/action/dlDisplay.do?vid=GUELPH&docId=vtug4389209&fn=pe

Available online at the Library

Horse Anatomy: A Coloring Atlas (Kainer, McCracken) (Textbook)

Available at Bookstore.

EQN*2040 Lab Manual (Notes)

3.2 Recommended Resource(s)

Essential Equine Studies: Book 1 – Anatomy and Physiology. Julie Brega. (Textbook)

ISBN 0851318932 (available at Bookstore. Also on Reserve in Library)

Anatomy and Physiology of Farm Animals (Frandsen) (Textbook)

e-version available through UofG Library.

3.3 Other Resources

1. Horse Anatomy Workbook (Raynor)
2. Conditioning Sport Horses (Clayton)
3. Equine Exercise Physiology (Hinchliff, Geor, & Kaneps)
4. Horse Anatomy: A Pictorial Approach to Equine Structure (P. Goody)
5. Clinical Anatomy of the Horse (Clayton)

6. Equine Color Genetics (Sponenberg)
7. The Glass Horse (Platinum Performance)
8. The Visible Horse: Anatomy in Motion 1 (Susan Harris)

3.3 Additional Costs

Steel-toe safety shoes are required for labs involving live horse demonstration/activities.

4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Be able to recognize and identify the major anatomical structures of the horse.
 2. Explain the function of the major equine anatomical structures and systems.
 3. To relate physiological functions to anatomical structures.
 4. To integrate knowledge of anatomy and physiology as it relates to the living horse.
 5. To compare physiological differences between horses and other species.
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5 Teaching and Learning Activities

5.1 Lecture

Week 1 Topic(s):	Introduction to Anatomy and Physiology
Week 2 Topic(s):	Gastrointestinal physiology
Week 3 Topic(s):	Skeletal system. Axial and appendicular skeleton. Anatomy and physiology of bone and joints. The stay apparatus.
Week 4 Topic(s):	The Integument. Skin, hair and hoof. Hoof form and function. Coat colour and markings.
Week 5 Topic(s):	Muscular system. Identify main locomotory muscles. Anatomy and physiology of muscle. Interaction between skeletal and muscular system in movement.
Week 6 Topic(s):	Cardiovascular system. Structure and function of blood. Components of the circulatory system. Cardiac cycle.

Topic(s): WINTER BREAK – NO CLASSES THIS WEEK

Week 7

Topic(s): Respiratory system. Body's defense system to protect the lungs. Gas exchange processes. Respiratory cycle.

Week 8

Topic(s): Urinary system. Functional physiology. Hormonal influences. Role of kidney in red blood cell formation. Factors that affect urine concentration.

Week 9

Topic(s): Nervous system.

Week 10

Topic(s): Endocrine system. Identify organs associated with hormone production. Differentiate between protein and steroid hormones - production and mode of action.

Week 11

Topic(s): Immune system. Humeral defenses - cellular, complement, antibodies, cell-mediated. Antibody production and antibody-antigen interactions. Concept of histocompatibility.

Week 12

Topic(s): Student Muscle Presentations

5.2 Lab

Week 2

Topic(s): Introduction to lab portion of course; safety procedures and protocols; video 'Equine Anatomy'

Week 3

Topic(s): Gross anatomy of the gastrointestinal system

Week 4

Topic(s): Examination of equine skeletal anatomy via models.

Week 5

Topic(s): Dissection of lower leg. Coat colour genetics.
Quiz 1 - Skeleton Histological exam of integument.

Colour coat genetics page due Week 6 in lab

Week 6

Topic(s): Muscles and introduction to conformation.
Quiz 2 - Integument (in Barn 37)

Colour coat genetics page due in lab.

Week 7

Topic(s): Dissection equine heart and lung.
Quiz 3 - Muscles

Week 8

Topic(s): Mid-term examination online via Courselink

Week 9

Topic(s): Dissection of kidney and urinalysis.
Quiz 4 - Cardio Respiratory

Week 10

Topic(s): Dissection of equine brain and eye.

Quiz 5 – Kidney and urinary system

Week 11

Topic(s): Diagnostic immunology

Quiz 6 – Nervous system

Week 12

Topic(s): No lab this week

Quiz 7 – Equine Eye

5.3 Laboratory and Barn Requirements

Students are required to wear appropriate footwear and clothing in the laboratory and barn.

6 Assessments

6.1 Assessment Details

Term Assignment (20%)

Date: Fri, Apr 5, Due by 11:59pm via dropbox

Learning Outcome(s): 1,2,3,4,5

Rubric for Term Assignment Papers

Title and Abstract (17.5/100)

Briefly states the purpose, why this area of research is important, and the key points that the review makes. (Title - 2.5 marks; Abstract – 15 marks)

Introduction (20/100)

The introduction should get the reader's attention, introduce the main idea of the report, and end with a strong thesis statement.

Body (50/100)

- **Use Headings / Subheadings to help organize the flow of topics and information**
- Paragraphs should begin with a clear topic sentence, which contains an important idea about your research topic. Supporting, detailed sentences should follow the topic sentence. The paragraph should end with a strong summary statement.
- Paragraphs should be arranged in the best possible order.
- Each section should end with a brief summary paragraph.
- Points to consider:
 - Are the topics stated in the thesis statement appropriately addressed in the report?
 - Did the student stay focused on the main topic and sub topics?
 - Are details used to explain and clarify the main issue/topic?

- Is the information, presented by the student, appropriate?
- Did the student adequately integrate research results?
- Did the students provide sufficient research data to reach a clear conclusion regarding the topic?
- Spelling checked? Punctuation checked? Capitalization checked? Grammar and usage checked?

Conclusions (5/100)

The conclusion repeats the main part of the report and ends with a final, interesting sentence. The thesis statement is often restated here. This is the place for YOUR OPINION. Based on your review of the literature, what do you conclude about your topic?

Spelling/Grammar (2.5/100)

The quality of a good paper can be greatly impaired by poor spelling and grammar. Be sure to check your work!

References (5/100)

Format references using the style of the Equine Veterinary Journal

See: [http://onlinelibrary.wiley.com/journal/10.1001/\(ISSN\)2042-3306/homepage/ForAuthors.html](http://onlinelibrary.wiley.com/journal/10.1001/(ISSN)2042-3306/homepage/ForAuthors.html)

GRADING SCHEME

Performance Element	Distinguished 90-100 Points	Proficient 80-90 Points	Intermediate 60-80 Points	Novice 0-60 Points
Purpose and Focus	Establishes and maintains clear focus; writer's central purpose or argument is readily apparent to the reader.	writing has a clear purpose or argument, but may sometimes digress from it.	central purpose or argument not consistently clear throughout paper.	Limited awareness of audience and/or purpose; The purpose or argument is generally unclear.
Content and Development of Ideas	Depth and complexity of ideas supported by pertinent details;	Depth of idea development supported by	Unelaborated idea development;	Minimal idea development, limited and/or

	evidence of analysis, reflection and insight. Balanced presentation of relevant and legitimate information that clearly supports a central purpose or argument and shows a thoughtful, in-depth analysis of a significant topic. Reader gains important insights.	elaborated, relevant details. Information provides reasonable support for a central purpose or argument and displays evidence of a basic analysis of a significant topic. Reader gains some insights.	unelaborated and/or repetitious details. Information supports a central purpose or argument at times. Analysis is basic or general. Reader gains few insights.	unrelated details. Central purpose or argument is not clearly identified. Analysis is vague or not evident. Reader is confused or may be misinformed.
References	References are primarily peer reviewed professional journals or other approved sources (e.g., government documents, agency manuals, ...). The reader is confident that the information and ideas can be trusted.	Although most of the references are professionally legitimate, a few are questionable (e.g., trade books, internet sources, popular magazines, ...). The reader is uncertain of the reliability of some of the sources.	Most of the references are from sources that are not peer reviewed and have uncertain reliability. The reader doubts the accuracy of much of the material presented.	There are virtually no sources that are professionally reliable. The reader seriously doubts the value of the material and stops reading.
Organization	The ideas are arranged logically to support the purpose or argument. They flow smoothly from one to another and are clearly linked to each other. The reader can follow the line of reasoning.	ideas are arranged logically to support central purpose or argument. For the most part, the reader can follow the line of reasoning.	In general, writing is arranged logically, though occasionally ideas fail to make sense. Reader is fairly clear about	Random or weak organization. The writing is not logically organized. Frequently, ideas fail to make sense together. The

			what writer intends.	reader cannot identify a line of reasoning and loses interest.
Sentence Structure	Controlled and varied sentence structure	Variety of sentence structure and length	Simplistic and/or awkward sentence structure	Incorrect or lack of topic and/or ineffective wording and/or sentence structure
Language	Precise and/or rich language	Acceptable, effective language	Simplistic and/or imprecise language	Incorrect and/or ineffective wording and/or sentence structure
Grammar and Formatting	Control of surface features	Few errors in grammar or format relative to length and complexity	Some errors in grammar and/or format that do not interfere with communication	Errors in grammar and format (e.g., spelling, punctuation, capitalization, etc)

Laboratory Reports (14%)**Learning Outcome(s):** 1,2,3,4

See Laboratory Schedule; Unless otherwise specified, all lab reports must be handed in at end of each lab. Lab work can be done in groups of 5 or less, however reports are graded as individual efforts.

Laboratory Quizzes (11%)**Learning Outcome(s):** 1,2,3,4

See lab schedule

Midterm (15%)**Date:** Week 8**Learning Outcome(s):** 1,2,3,4,5

Exam via courselink during your regularly scheduled lab session. See Laboratory Schedule

Final Exam (25%)**Learning Outcome(s):** 1,2,3,4,5

Date TBA. Exam online via courselink.

Muscles assignment (15%)**Date:** Week 12, during regular class time**Muscles Assignment**

Presentations will be made during class time in Week 12

Worth 15% of your final grade. Students will work in groups of ~6-9 people (max 3 students per task, see below)

Groups will sign up for one of the following muscle groups:

- head and neck
- shoulder
- trunk
- pelvis
- forelimbs
- hindlimbs

- stay apparatus (fore and hind)

Within each group, approximately equal numbers of students will work on one of following tasks:

1. create a visually-appealing, creative 15-min presentation (can be powerpoint, poster-board, clay models etc)
2. present their work to the class in a 1-min oral presentation
3. create a one-page hand-out for the audience

Grading Rubric

Students in each group will receive INDIVIDUAL GRADES for this assignment. Grade will be comprised of 50% instructor grade and 50% group members' grade (scoresheet attached)

Instructor Grade:

Names of presenters: Trunk Group	Assessment									
1. Overall quality of the presentation? (ie. slide quality, talk content, summary, time, creativity?)	3	4	5	6	7	8	9	10		

1. Did the presenters demonstrate creativity in their handout material?									
1. Was the material presented (presentation and handouts) in an organized fashion? (ie. structure and logical order)									
1. Was the material presented in an interesting way? (eg. attention drawn, lively voice, enthusiasm?)									
1. Was the audio-visual material clear and informative? (eg. figures, graphs, text font, colour and oral text)									
1. Were questions handled well? (eg. did presenters show good understanding of the topic?)									

Group member scoresheet - Please complete for all group members (EXCLUDING YOURSELF) and hand in to the course instructor on presentation day

Group member name: _____
 ___/10

Overall Score

- contributed equally to the overall workload _____/5
- attended all group meetings _____/3
- contributed creative ideas to the overall project _____/2

Group member name: _____
Score___/10

Overall

- contributed equally to the overall workload _____/5
- attended all group meetings _____/3
- contributed creative ideas to the overall project _____/2

Group member name: _____
___/10

Overall Score

- contributed equally to the overall workload _____/5
- attended all group meetings _____/3
- contributed creative ideas to the overall project _____/2

Group member name: _____
___/10

Overall Score

- contributed equally to the overall workload _____/5
- attended all group meetings _____/3
- contributed creative ideas to the overall project _____/2

Group member name: _____
___/10

Overall Score

- contributed equally to the overall workload _____/5
- attended all group meetings _____/3
- contributed creative ideas to the overall project _____/2

Group member name: _____

Overall Score

____/10

- contributed equally to the overall workload _____/5
- attended all group meetings _____/3
- contributed creative ideas to the overall project _____/2

Group member name: _____
 ____/10

Overall Score

- contributed equally to the overall workload _____/5
- attended all group meetings _____/3
- contributed creative ideas to the overall project _____/2

6.2 Term Assignment

The assignment is designed so that the student can integrate knowledge gathered in lectures and labs with information found in primary research papers. The research review paper is intended to be a state-of-the-art scientific review of what is known, and NOT known, about the APPROVED equine anatomy topic you have chosen to study.

Students will find a topic of interest pertaining to a question or a problem in Equine Anatomy or Physiology. Please note that it is **the student's responsibility** to ensure that your topic is approved by the instructor prior to commencing work on your paper. Students will prepare a detailed literature review, according to the instructions below.

PLEASE FOLLOW INSTRUCTIONS CAREFULLY.

- A minimum of 10 peer reviewed scientific research papers
 - review papers and text books may be used as resources but cannot be counted in your 10 research papers
- Proper referencing using the Equine Veterinary Journal style
- 11 pt time new roman font, 1.5 inch margins, single-spaced
- 6-8 pages (DO NOT EXCEED MAXIMUM PAGE LENGTH)
 - Diagrams, tables and references are in addition to the page count.
- **Subheadings must be used** to organize your paper, and format should follow

that of a published review paper

Rubric for Term Assignment Papers

Title and Abstract (20/100)

Briefly states the purpose, why this area of research is important, and the key points that the review makes.

Introduction (20/100)

The introduction should get the reader's attention, introduce the main idea of the report, and end with a strong thesis statement.

Body (50/100)

- Use Headings / Subheadings to help organize the flow of topics and information
- Paragraphs should begin with a clear topic sentence, which contains an important idea about your research topic. Supporting, detailed sentences should follow the topic sentence. The paragraph should end with a strong summary statement.
- Paragraphs should be arranged in the best possible order.
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- Points to consider:
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 - Is the information, presented by the student, appropriate?
 - Did the student adequately integrate research results?
 - Did the students provide sufficient research data to reach a clear conclusion regarding the topic?
 - Spelling checked? Punctuation checked? Capitalization checked? Grammar and usage checked?

Conclusions (5/100)

The conclusion repeats the main part of the report and ends with a final, interesting sentence. The thesis statement is often restated here.

References (5/100)

Format references using the style of the Equine Veterinary Journal

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Content and Development of Ideas	Depth and complexity of ideas supported by pertinent details; evidence of analysis, reflection and insight. Balanced presentation of relevant and legitimate information that clearly supports a	Depth of idea development supported by elaborated, relevant details. Information provides reasonable support for a central purpose or	Unelaborated idea development; unelaborated and/or repetitious details. Information supports a	Minimal idea development, limited and/or unrelated details. Central purpose or argument is not clearly

GRADING SCHEME

Performance Element	Distinguished 90 - 100 Points	Proficient 80 - 90 Points	Intermediate 60 - 80 Points	Novice 0 - 60 Points
	central purpose or argument and shows a thoughtful, in-depth analysis of a significant topic. Reader gains important insights.	argument and displays evidence of a basic analysis of a significant topic. Reader gains some insights.	central purpose or argument at times. Analysis is basic or general. Reader gains few insights.	identified. Analysis is vague or not evident. Reader is confused or may be misinformed.
References	References are primarily peer reviewed professional journals or other approved sources (e.g., government documents, agency manuals, ...). The reader is confident that the information and ideas can be trusted.	Although most of the references are professionally legitimate, a few are questionable (e.g., trade books, internet sources, popular magazines, ...). The reader is uncertain of the reliability of some of the sources.	Most of the references are from sources that are not peer reviewed and have uncertain reliability. The reader doubts the accuracy of much of the material presented.	There are virtually no sources that are professionally reliable. The reader seriously doubts the value of the material and stops reading.
Organization	The ideas are arranged logically to support the purpose or argument. They flow smoothly from one to another and are clearly linked to each other. The reader can follow the line of reasoning.	Ideas are arranged logically to support central purpose or argument. For the most part, the reader can follow the line of	In general, writing is arranged logically, though occasionally ideas fail to make sense. Reader is fairly	Random or weak organization. The writing is not logically organized. Frequently, ideas fail to make sense

GRADING SCHEME

Performance Element	Distinguished 90 - 100 Points	Proficient 80 - 90 Points	Intermediate 60 - 80 Points	Novice 0 - 60 Points
		reasoning.	clear about what writer intends.	together. The reader cannot identify a line of reasoning and loses interest.
Sentence Structure	Controlled and varied sentence structure	Variety of sentence structure and length	Simplistic and/or awkward sentence structure	Incorrect or lack of topic and/or ineffective wording and/or sentence structure
Language	Precise and/or rich language	Acceptable, effective language	Simplistic and/or imprecise language	Incorrect and/or ineffective wording and/or sentence structure
Grammar and Formatting	Control of surface features	Few errors in grammar or format relative to length and complexity	Some errors in grammar and/or format that do not interfere with communication	Errors in grammar and format (e.g., spelling, punctuation, capitalization, etc)

7 Course Statements

7.1 Grading Policies

Course policy on late assignments: penalty of 20% per day for maximum of three days after which no assignments will be accepted without approved academic consideration. For your Term Assignment, the late penalty will be charged for each day later than 11:59pm.

Alternate assessments will be offered only to students with documented medical, psychological, or compassionate reasons for missing a scheduled assessment. An Academic Consideration form must be submitted to the instructor. Go to <https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac-ac.shtml> for information on regulations and procedures related to Academic Consideration.

Late assignments without the aforementioned documentation will receive a penalty of 20% per day, for up to a maximum of 3 days. Assignments submitted later than 3 days will not be accepted and will result in a zero grade. We do not provide makeup labs, quizzes or exams.

7.2 Course Policy on Group Work

Unless otherwise specified, all lab reports must be handed in at end of each lab. Lab work can be done in groups of 5 or less, however reports are graded as individual efforts.

7.3 Course Policy regarding use of electronic devices and recording of lectures

The general use of small, personal electronic devices (e.g. cell phones, iPods) during class is disruptive and disrespectful. As a result, their use in the classroom for reasons other than instructor-led learning is prohibited.

The use of a laptop for the purpose of taking notes/learning in the classroom is a *privilege*. Any student abusing this concession by using a laptop in class for other purposes will have the privilege revoked.

8 University Statements

8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a

teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.3 Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for course registration are available in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

More information can be found on the SAS website

<https://www.uoguelph.ca/sas>

8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

8.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>
