ANEQ305 – Functional Large Animal Physiology – Fall 2017

MWF 8:00-8:50 AM Room 202 Clark A

A. Instructor

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Office hours: By appointment

B. Course Description

Introduction to the basic concepts of farm animal physiology with emphasis on concepts relating to topics relevant to the fields of food animal and equine science.

C. Course Objective

Successful students will acquire fundamental knowledge of animal physiology that allows application of basic physiological principles to in-depth studies in animal and equine science. Specific course objectives are to:

- Develop a working knowledge of physiological terminology
- Differentiate and study basic physiological systems of farm animals
- Integrate and apply physiological principles to farm animal management techniques.

D. Topics

1. Cell organelles and their function
2. Membrane physiology
3. Nervous system
4. Muscle physiology
5. Endocrine system
6. Circulatory system
7. Respiratory system
8. Excretory system
9. Digestive system
10. Reproductive system
11. Immune system

E. Prerequisites:

LIFE 102
CHEM 107 or CHEM 111

F. Textbook:

- Animal Physiology from Genes to Organisms by L. Sherwood, H. Klandorf and P. H. Yancey (Required and can be purchased online at http://biology.brookscole.com/animalphys1)

G. Examinations:

- Quiz1 20 points
- Quiz2 20 points
- Quiz3 20 points
- Quiz4 20 points
- Quiz5 20 points
- Exam 1 50 points
- Exam 2 50 points
- Exam 3 50 points
- Exam 4 50 points
- Term paper 50 points
- Final exam 170 points
- Total: 500* points

- **The final exam will be comprehensive and is required.** Final Exam: December 12, 2017 4:10 PM-6:10 PM.
- Term paper: **Electronic AND paper copy due: 5PM, October 31, 2017 to Canvas, submit in the Microsoft word format or compatible form that can be opened by Microsoft Word**.
- ***There will be no make-up exams/quizzes***, except for valid absences. Valid absences include: 1) Medical emergency—a written and signed note from a medical doctor is required. 2) Participation in a CSU-sanctioned activity—a letter from the supporting faculty is required **PRIOR** to the absence.
- Students who miss an exam or quiz and do not have a valid excuse will receive a zero.
- Class attendance is mandatory. Unexcused absence of classes more than 12 classes will receive an F for the course grade.
- It is YOUR RESPONSIBILITY to obtain any information announced in class.
- **Cheating/plagiarism on any exam, quiz or assignment will result in removal from the course and assignment of an 'F' for the course grade and will be reported to the Conflict Resolution and Student Conduct Services for further review. Additional Sanctions may include suspension or expulsion from the University. Please refer to the University policies on academic dishonesty and classroom behavior in the General Catalog.**
- Exam and quiz scores will not be curved.

H. Grading:

≤90 <100% (450-500 points) A
≤80 <90% (400-449 points) B
≤70 <80 % (350-399 points) C
≤60 <69 % (300-349 points) D
< 60% (below 300 points) F

- ***Lowest quiz score will be dropped from your grade.***

Lecture and Exam Schedule Fall 2017

DATE	TOPIC	Suggested Reading
Aug 21	Introduction & Overview	
Aug 23	Organization & terminology	Chap 1 1-22
Aug 25	Cell organelles and their function	Chap 2 25-59
Aug 28	Cell organelles and their function	Chap 2 25-59
Aug 30	Membrane & Membrane Transport	Chap 3 70-90, 102-108
Sep 1	Membrane & Membrane Transport	Chap 3 70-90, 102-108
Sep 4	**University Holliday-No Class**	
Sep 6	Neural Physiology	Chap 4 111-145
Sep 8	Neural Physiology/System	Chap 4 111-145
Sep 11	Nervous system	Chap 5 156-166
Sep 13	Nervous system	Chap 5 156-166
Sep 15	**Exam 1**	
Sep 18	Muscle anatomy/physiology	Chap 8 335-353
Sep 20	Muscle anatomy/physiology	Chap 8 359-382
Sep 22	Endocrine system - hormones	Chap 7 268-273
Sep 25	Hormone signaling & receptors	Chap 7 273-278
Sep 27	Pituitary and hormone control	Chap 7 281-291
Sep 29	Thyroid, Adrenal & Parathyroid	Chap 7 297-312 & 323-333
Oct 2	Body fluids/Blood	12 & 612-618
Oct 4	Blood	Chap 9 387-399
Oct 6	**Exam 2**	
Oct 09	Cardiovascular system - overview	Chap 9 402-411
Oct 11	Cardiovascular system – cardiac cycle	Chap 9 412-419
Oct 13	Cardiac output & blood flow	Chap 9 419-448
Oct 16	Respiration	Chap 11 493-498, 517-527
Oct 18	Respiration	Chap 11 527-542
Oct 20	Kidney	Chap 12 557-566
Oct 23	Kidney	Chap 12 569-604
Oct 25	Digestive Anatomy - comparisons	Chap 14 654-666
Oct 27	**Exam 3**	
Oct 30	Digestion –the gut	Chap 14 690-712
Nov 1	Digestion – enzymes & hormones	Chap 14 631-634
Nov 3	Digestive glands - liver & pancreas	Chap 14 682-690
Nov 6	Metabolism - nutrient absorption	Chap 14
Nov 8	Reproduction - endocrinology	Chap 16 775-777, 790-794
Nov 10	Reproduction-endocrinology	Chap 16 775-777, 790-794

Nov 13	Reproductive physiology - male	Chap 16 770-783
Nov 15	Reproductive physiology - female	Chap 16 783-795
Nov 17	**Exam4**	
Nov 20	**Fall Recess**	
Nov 22	**Fall Recess**	
Nov 24	**Fall Recess**	
Nov 27	Reproductive physiology - female	Chap 16 783-795
Nov 29	Reproductive physiology - female	Chap 16 783-795
Dec 1	Pregnancy & parturition	Chap 16 799-809
Dec 4	Lactation	Chap 16 810-814
Dec 6	Immunology	Chap 10 464-472
Dec 8	Immunology	Chap 10 472-488
Dec 12	**Final 4:10 PM- 6:10 PM, Clark A 202**	

ANEQ305 Fall 2016 Term Paper Guidelines

Purpose:

The goal of the term paper is to understand physiological phenomenon more in depth. Choice of topic is up to you as long as it directly relates to physiology.
The animals of the topic are limited to farm animals (such as bovine, ovine, equine, swine and poultry).
The format of paper should include introduction of your topic of choice, history of the topic, detailed description about the physiology of topic (such as mechanism, how it works, how it happens, what are the consequences), current status of topic (what do we know about it now), and conclusion (what will happen in the future).

Format

Length: The total length of paper should be minimum **FULL** 8 pages and maximum 10 pages **excluding** the reference page. The body of the text may include figures/diagrams/tables, however, they will **NOT** be counted for the page requirement.

Page format: **12 font**, **1.5 line spaced**, **1 inch margin** in all direction.

Print your legal name on the top right of each page.
Do not include front cover page.
Print double sided if possible.

Due date:

Electronic and paper copy: 5:00 PM October 31, 2016.
Submit hard copy as well as an electronic copy to CANVAS.
Your term paper file name: your family name-given name-ANEQ305-FA16-termpaper
Example: doe-john-ANEQ305FA16-termpaper
Also type this file name on your subject line when you email the file.

References:

Term paper must include minimum of 6 refereed journal article references. Minimum of 3 references should be old references for the history of the topic. At least 2 references should include up to date information. Depends on the topic, published book can be used as references. However, minimum of 3 scientific journal articles should be cited.

In text direct quotation is not allowed.

Reference Format

Refer to Journal of Animal Science Instructions for Authors Literature Cited guideline here for style http://www.journalofanimalscience.org/site/misc/JAS-InstructionsToAuthors.pdf

Physiology – Terminology

1. Directional Terms and Planes
    a. **Cranial or Anterior** is a direction toward the head. The lungs are cranial to the intestines (closer to the head).
    b. **Caudal or posterior** is a direction toward the tail. The intestines are caudal to the lungs (closer to the tail).
    c. **Dorsal** pertains to the back or upper surface of an animal. Often used to indicate the position of one structure of the body relative to another, i.e., nearer the back surface of the body. The kidneys are dorsal to the intestines.
    d. **Ventral** pertains to the undersurface of an animal, and as with dorsal, is often used to indicate the position of one structure relative to another. The intestines are ventral to the kidneys.
    e. **Medial** relates to the middle or center; nearer to the median or midsagittal plane. The heart is medial to the lungs.
    f. **Lateral** is opposite to the meaning of medial, i.e., away from the median plane. The ribs are lateral to the lungs. A lateral radiographic (x-ray) view is one with the animal on its side and the film in the sagital plane.
    g. **Proximal,** when referring to part of a limb, artery, or nerve, means it is nearest the center of the body or the point of origin.
    h. **Distal** means relatively further from the center of the body. The hoof is distal to the knee.

2. General Terms
    a. **Coronary** refers to heart
    Example: The coronary arteries are in the heart.
    b. **Hepatic** refers to liver
    Example: The hepatic portal system refers to the vessel between the gut and the liver.
    c. **Renal** refers to kidney
    Example: the renal medulla is the inner area of the kidney.
    d. **Neuro** refers to nerve
    Example: A neurotransmitter is a chemical released from the axon terminal of a neuron.
    e. **Medulla** refers to the inner portion
    Example: The adrenal medulla is the inner portion of the adrenal gland.
    f. **Cortex** refers to outside portion
    Example: The renal cortex is the outer portion of the kigney.

3. Prefix/Suffix
    a. **Hypo --** Less than or lower
    Example: Hypothermia refers to low body temperature.

    b. **Hyper --** More than or higher.
    Example: Hypertension is high blood pressure.

    c. **Iso --** Equal to or similar
    Example: Isotonic solutions have an osmolarity equal to normal body fluid.

    d. **Juxta --** Adjacent to
    Example: The juxtaglomerula apparatus is adjacent to the glomerula of the kidney.

    e. **Macro --** Large or relatively large
    Example: Macrophages are large tissue – bound phagocytes

    f. **Micro --** Small or relatively small
    Example: Microvilli are small hair like projections from the luminal surface in the gut

    g. **Myo --** Refers to muscle
    Example: Myocardium in a muscle layer in the heart.

    h. **Cere --** refers to brain

    i. **Endo --** From within
    Example: Endometrium is the inner layer of the uterus

    j. **Exo --** Moves to the outside
    Example: Exocytosis is the process of expelling from the cell to outside the cell.

    k. **Hemo --** Refers to blood
    Example: Hemodynamics refers to the physics of blood flow

    l. **Intra --** Within
    Example: Intracellular fluid is within the cell

    m. **Extra --** Outside
    Example: Extracellular fluid is outside the cell

    n. **Pre --** before
    Example: Preganglionic fiber is before the ganglion

o. **Post --** after
Example: Post synaptic neuron is the neuron after the synapse

p. **Para --** beside or near
Example: Paracrine glands have influence in a local (or near) area

q. **-- ase** Typically an enzyme
Example: Lipase is an enzyme that digests lipids.

r. **-- genesis** The formation of or synthesis of.
Example: Gluconeogenesis is the process of forming glucose from other nutrients.

s. **-- tropin** Refers to target
Example: Gonadotropins target and impact the gonads.

t. **Vaso--** Refers to a blood vessel or blood flow
Example: Vasodilation is the increase in blood vessel diameter

u. **Osteo--** Having to do with bone
Example: Osteoblasts are bone cells that produce matrix in bone.