Term Information

Effective Term	Autumn 2017
Previous Value	*Autumn 2016*

Course Change Information

What change is being proposed? (If more than one, what changes are being proposed?)

Change in course content

What is the rationale for the proposed change(s)?

To better align content with the course description, reduce redundancy across existing foundational courses within the department, and strengthen content that aims to promote an understanding of modern science through an animal systems approach.

What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

None

Is approval of the requrest contingent upon the approval of other course or curricular program request? Yes

Please identify the pending request and explain its relationship to the proposed changes(s) for this course (e.g. cross listed courses, new or revised program)

Requested changes are contingent upon approval of ANIMSCI 2200.01, the non-honors version of the course, and ANIMSCI 2100. Specifically, content currently

covered in ANIMSCI 2300H & 2200.01 (animal industries overview and management practices) will be included in the reinvisioned ANIMSCI 2100. In turn, content of the animal products will be removed from ANIMSCI 2100 and covered in 2300H to extend basic scientific principles underlying animal products.

Is this a request to withdraw the course? No

General Information

Course Bulletin Listing/Subject Area	Animal Sciences
Fiscal Unit/Academic Org	Animal Sciences - D1132
College/Academic Group	Food, Agric & Environ Science
Level/Career	Undergraduate
Course Number/Catalog	2300H
Course Title	Honors Introductory Animal Sciences
Transcript Abbreviation	Hon Ani Sci Intro
Course Description	A study of the basic principles of genetics, breeding, reproduction, nutrition, behavior, and biotechnology as it applies to the molecular, cellular, and physical underpinnings of domesticated animal form and function.
Semester Credit Hours/Units	Fixed: 3

Offering Information

Length Of Course	14 Week, 12 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	No
Grading Basis	Letter Grade
Repeatable	No

Course Components	Recitation, Lecture
Grade Roster Component	Lecture
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites	Prereq: Honors standing, or permission of instructor.
Exclusions	Not open to students with credit for 2200.01.

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	01.0901
Subsidy Level	Baccalaureate Course
Intended Rank	Freshman, Sophomore

Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors
General Education course:
Biological Science

Course Details

Course goals or learning objectives/outcomes

- A biological systems based approach to equip a broad range of students with the knowledge and critical thinking skills required to address questions concerning the maintenance, reproduction, and performance of domestic animals
- Be familiar with the historical, social, and biological contexts that govern the study of animals
- Understand basic principles of genetics, breeding, reproduction, nutrition, behavior, and biotechnology
- Appreciate the molecular, cellular, and physical underpinnings of animal form and function
- Develop the ability to critically evaluate concepts in science as they are applied to the study of animals
- Construct innovative approaches to, and solutions of, problems encountered when maintaining animals for human benefit
- Appreciate the uses of animals and the social attitudes regarding how animals are used
- Have a broad understanding of biotechnology and its uses toward advancing the health and well-being of animals
- Consider positive and negative implications of applying modern technology to animal systems

Content Topic List

- Evolution of domesticated species and the process of their domestication
- Animal behavior and welfare
- Nutrition: nutrient requirements, physiology, and the importance of different digestive strategies
- Organization of biological systems from molecular structures to physical features
- Genetics & application of genetics for animal breeding: natural versus artificial selection
- Biotechnology: progress, applications, and limitations
- Principles of reproduction and assisted reproductive technologies
- Lactation strategies: nutritional and immunological support of the young
- Food & Fiber: Eggs, Milk, Muscle, Fiber

Previous Value

- *Process of domestication and a historical perspective of how animals and animal sciences have evolved*
- *Animal behavior and welfare*
- *Nutrition: nutrient requirements, physiology, and the importance of different digestive strategies*
- *Organization of biological systems from molecular structures to physical features*
- *Genetics & application of genetics for animal breeding: natural versus artificial selection*
- *Biotechnology: progress, applications, and limitations*
- *Principles of reproduction and assisted reproductive technologies*
- *Lactation strategies: nutritional and immunological support of the young*
- *Animal form and function: ruminants, small ruminants, pseudo-ruminants, hind-gut fermenters, simple nonruminants, avians, and aquatics*
- *Global status of the animal industries*

Attachments

- 2100_2200_CourseChange_2016.pdf: Rational

  (Cover Letter. Owner: Lyvers Peffer,Pasha A)
- ANIMSCI 2300H Syllabus_AU_17_Proposed.pdf: Proposed Syllabus

  (Syllabus. Owner: Lyvers Peffer,Pasha A)
- ANIMSCI 2300H Syllabus.pdf: Current Syllabus

  (Syllabus. Owner: Lyvers Peffer,Pasha A)
- ANIM SCI 2200_01_02_03_ASCC Feedback.pdf: Cover Letter

  (Cover Letter. Owner: Lyvers Peffer,Pasha A)
- 2100_2200_CourseChange_2016_ASCC NMS.pdf: Course Change Proposal

  (Other Supporting Documentation. Owner: Lyvers Peffer,Pasha A)
- GE ASSESSMENT PLAN 2300H.pdf: GE Course Assessment Plan

  (GEC Course Assessment Plan. Owner: Lyvers Peffer,Pasha A)

Comments

- The requested information has been uploaded *(by Lyvers Peffer,Pasha A on 11/10/2016 04:03 PM)*
- Please see email sent 10-11-16 *(by Hogle,Danielle Nicole on 10/11/2016 03:02 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Lyvers Peffer,Pasha A	07/11/2016 11:06 AM	Submitted for Approval
Approved	Neal,Steven Michael	09/14/2016 02:20 PM	Unit Approval
Approved	Neal,Steven Michael	09/14/2016 02:20 PM	College Approval
Revision Requested	Hogle,Danielle Nicole	10/11/2016 03:02 PM	ASCCAO Approval
Submitted	Lyvers Peffer,Pasha A	11/10/2016 04:03 PM	Submitted for Approval
Approved	Neal,Steven Michael	11/10/2016 04:54 PM	Unit Approval
Approved	Neal,Steven Michael	11/10/2016 04:55 PM	College Approval
Pending Approval	Nolen,Dawn Vankeerbergen,Bernadette Chantal Hanlin,Deborah Kay Jenkins,Mary Ellen Bigler Hogle,Danielle Nicole	11/10/2016 04:55 PM	ASCCAO Approval

THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL, ENVIRONMENTAL SCIENCES
DEPARTMENT OF ANIMAL SCIENCES

November 1, 2016
CFAES Academic Affairs
100 Agricultural Administration
Columbus, OH 43210

On behalf of the Department of Animal Sciences Academic Affairs Committee, I am submitting course change requests for ANIM SCI 2100 (Appreciation of Production and Companion Animals) and ANIM SCI 2200.01/2300H (Introductory Animal Sciences/Honors Introductory Animal Sciences). Specifically, the request is for a change in lecture content, and changes in course offering length, format, credit hours, and course title for ANIMSCI 2100. ANIMSCI 2200.01 and 2300H are Introductory Animal Sciences and Honors Introductory Animal Sciences, respectively. These lecture only courses fulfill the Natural Science: Biological GE category. A separate laboratory for these courses, ANIMSCI 2200.02, can be taken in addition to fulfill the GE lab science requirement. The current course change request impacts ANIMSCI 2200.01 and 2300H, but does not impact the separate laboratory course ANIMSCI 2200.02.

Original Content

ANIM SCI 2100 provides a broad overview of the domesticated animals, their related industries, and the products of these systems (food, fiber, milk, eggs, and companionship). In the first seven weeks, the course begins with a review of biological and chemical aspects of animal systems, and then discusses the resulting products that are obtained from animal systems. During the second seven weeks, the focus is on the companion animal industries. The discussion of companion animals includes the care, social and ethical considerations of companion animal use, and industry structure. Students gain a broad foundation of animal husbandry, management systems, and contributions of animals to human society.

Animal Sciences 2200.01 is a study of the basic principles of evolution & domestication, genetics, breeding, reproduction, nutrition, behavior, and biotechnology as it applies to the molecular, cellular, and physical underpinnings of domesticated animal form and function. Students are introduced to the foundations of biological systems and diversity and how knowledge in this area is applicable toward appropriate management of domesticated animals. Animals explored in depth include horses, cattle, pigs, poultry (chickens, ducks, geese, etc.), sheep, goats, and llamas. Students consider how the study of animals has advanced from early scientific discoveries and gain an appreciation of how human intervention has shaped animal form and function. Through the study of animal systems from the local to global arena, students appreciate the use of animals and their contributions across diverse populations and understand the local and global impacts of the application of new technologies to the animal industries. The first 10 weeks of the course focuses on the molecular, cellular, and organismal aspects of aforementioned scientific disciplines. The remaining weeks of the course consider application of these principles within domesticated animal industries, at the organismal level.

Proposed Content

Specifically, content of the animal industries and current animal management practices will be removed from ANIMSCI 2200.01 and covered in ANIMSCI 2100. In turn, content of the animal products will be removed from ANIMSCI 2100 and covered in 2200.01 to extend basic scientific principles to animal morphology.

Rationale

ANIMSCI 2100 provides an overview of the companion animal industries, comparable discussions of the food production industries are lacking. Reorganization of the content to include this information provides students a

201 Plumb Hall / 2027 Coffey Road / Columbus, OH 43210 / 614-292-3896 Phone / 614-292-7116 Fax / lyvers-peffer.1@osu.edu

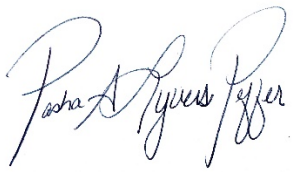
context to reflect on the similarities and differences, value, and societal contributions of the collective animal industries as directed by the animal's primary use and fulfills the original goals of the course to consider domesticated animals, their related industries, and their economic impact. Discussions of animal products in ANIMSCI 2200.01 provides a context to focus on the chemical and biological aspects of animal systems from a molecular and cellular context to strengthen the goals of the course, which aim to promote an understanding of modern science through an animal systems approach.

The requested changes in lecture content aligns with already established course descriptions. Accordingly, including content of production animal industries in ANIMSCI 2100 supports the role of this course in providing an overview of the size and scope of companion animal and production animal systems. Including discussions of animal products in ANIMSCI 2200.01 reinforces an understanding of the principles, theories and methods of modern sciences and the role of scientific discoveries in shaping animal form and function.

In addition, changes in course offering length, format, credit hours, and course title for ANIMSCI 2100 is proposed. The title of the re-envisioned course is proposed as Animal Systems and will be designated as 2200.03. Currently, ANIMSCI 2200.01 is the required introductory course. Re-numbering of the course is requested to facilitate enrollment in 2200.01 prior to enrollment in 2200.03. The course will be offered as a 7 week session course, online, at 2 credit hours. A reduction in credit hours is supported by a reduction in course content that occurs with the removal of topics on biological and chemical aspects of animal systems, which are topics also covered in ANIMSCI 2200.01.

Thank you for your consideration of these course change requests.

Sincerely,



Pasha A. Lyvers Peffer
Associate Professor
Academic Affairs, Chair

201 Plumb Hall / 2027 Coffey Road / Columbus, OH 43210 / 614-292-3896 Phone / 614-292-7116 Fax / lyvers-peffer.1@osu.edu

THE OHIO STATE UNIVERSITY

College of Food, Agricultural, and Environmental Sciences

Department of Animal Sciences

214 Animal Sciences
2029 Fyfe Road
Columbus, OH 43210

614-292-3896 Phone
614-292-7116 Fax

lyvers-peffer.1@osu.edu

November 1, 2016

Dear ASCC Natural and Mathematical Sciences Panel Members,

The feedback following review of Animal Sciences 2200.01 and 2300H by the ASCC Natural and Mathematical Sciences Panel is addressed as follows:

Submit a GE assessment plan

A GE assessment plan has been uploaded for both ANIMSCI 2200.01 and 2300H.

Explicitly state in the proposal that the lab is a separate course

The following information was included and highlighted in paragraph one of the proposal letter:

ANIMSCI 2200.01 and 2300H are Introductory Animal Sciences and Honors Introductory Animal Sciences, respectively. These lecture only courses fulfill the Natural Science: Biological GE category. A separate laboratory for these courses, ANIMSCI 2200.02, can be taken in addition to fulfill the GE lab science requirement. The current course change request impacts ANIMSCI 2200.01 and 2300H, but does not impact the separate laboratory course ANIMSCI 2200.02.

Clarify the relationship between the courses (2100, 2200.01, and 2300H).

Students enrolled in the Animal Sciences major (Biosciences and Industries specialization) are currently required to complete ANIMSCI 2100 and 2200.01 or 2300H (the honors version of 2200.01). ANIMSCI 2200.01 (and 2300H) serve as the introductory courses for animal sciences majors and teaches basic principles of animal systems (evolution & domestication, genetics, breeding, reproduction, nutrition, behavior, and biotechnology), and introduces the livestock industries. ANIMSCI 2200.01 (or 2300H) is a prerequisite for other courses in the major and is intended for completion by rank 1 students in the major. ANIM SCI 2100 provides a broad overview of the domesticated animals, their related industries, and the products of these systems (food, fiber, milk, eggs, and companionship). While required in the major, the course is not a prerequisite to other courses in the major.

In the re-envisioned courses, 2200.01 (and 2300H) will expand biological and chemical principles of animal systems; whereas, 2100 (renumbered as 2200.03) will continue to provide an overview of the size and scope of companion animal industries and now include production animal systems. Students in the major will still be required to complete 2200.01 (or 2300H) and 2200.03 (formerly

2100). The proposed changes in these courses remove redundancy in course content while delivering foundational concepts of the major (1. basic biological and chemical principles of animal systems, and 2. animal industries and production systems) in a more logical course of study. ANIMSCI 2200.01 (and 2300H) will remain as introductory course for the major and prerequisite for other courses in the major. It is intended, though not required, that students will complete ANIMSCI 2200.01 (or 2300H) prior to 2200.03. In summary, ANIMSCI 2200.01 (or 2300H) will teach basic scientific principles of animal systems, and 2200.03 (formerly 2100) will teach applied principles of animal systems.

Sincerely,

Pasha A Lyvers Peffer
Associate Professor, The Ohio State University

ANIM SCI H2300: Honors Introductory Animal Sciences
Fall Semester, 2015

Lecture: Monday, Wednesday and Friday; 1:50-2:45am, 202 Animal Sciences Building
Laboratory: Tuesday; 3:00-5:05pm, 111 Animal Sciences
Recitation: Thursday; 1:50-2:45pm, 107 Plumb Hall

Instructor: Lecture and Laboratory
Pasha A Lyvers Peffer, Department of Animal Sciences
lyvers-peffer.1@osu.edu, 292-3896
Office hours: Tuesday, 11:00-12:30 & Wednesday, 12:30-1:30.

Recitation
Ann Ottobre, Department of Animal Sciences
ottobre.1@osu.edu, 292-7135

Assistants: Doug Liebe (Laboratory)
Liebe.2@osu.edu

Caitlyn Mullins, B.S., Department of Animal Sciences (Lecture & Laboratory)
mullins.331@buckeyemail.osu.edu

Allison Pullin, B.S., Department of Animal Sciences (Recitation)
pullin.4@buckeyemail.osu.edu

Prerequisites: Honors standing, or permission of instructor. Not open to students with credit for 2200.01 and 2200.02. GE Nat Sci Bio course.

Text: Required: ANIMAL SCIENCES, Peffer and Day. Kendall Hunt Publishing; Dubuque, IA:2014. ISBN-10: 1465250107; ISBN-13: 978-1465250100

Goals and Objectives of the GE Natural Science Category: Courses in natural sciences foster an understanding of the principles, theories and methods of modern sciences, the relationship between science and technology, and the effects of science and technology on the environment.

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students learn key events in the history of science.
3. Students provide examples of the inter-dependence of scientific and technological developments.
4. Students discuss social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

How students meet the GE Natural Science objectives through this course: Students will learn how systematic observations of the natural world have helped define current concepts of science and the role of controlled experimentation in support of early scientific theories through discussions of behavior. An understanding of the foundations of modern science will be acquired through discussions of cell theory, heredity, physiological ecology, energy transfer, and evolutionary strategies of todays domesticated species. Students will gain an appreciation of how human intervention has shaped animal form and function throughout history and the role of technology; addressing the implications of biotechnologies current and future applications.

Goals and Objectives: Honors Introductory Animal Sciences is a Natural Science (Biological Science), general education, course that promotes an understanding of modern science through a biological systems based approach. Students learn of the relationship between science and technology, consider the implications of scientific discoveries, and acquire the knowledge and critical thinking skills required to evaluate the potential of science and technology to address problems from a global arena as they pertain to domestic animals used for human benefit.

1. Students appreciate whole animal structure, form and function; growth and development of systems from the cellular level.
2. Students integrate knowledge among anatomy, physiology, genetics, nutrition, and reproduction.
3. Students learn techniques applicable to animal management systems.
4. Students gain knowledge toward the respectful management of animals and the environment.
5. Students gain awareness of how the disciplines of Animal Sciences enhance animal management systems and impact their resulting products

How students meet objectives through this course: The course embodies fundamental concepts in areas of genetics, reproduction, nutrition, behavior, and biotechnology. Students are introduced to the molecular and cellular mechanisms that underscore the function of biological systems and how knowledge in this area is applicable toward appropriate management of domesticated animals. Students will consider how the study of animals has advanced from early scientific discoveries. Through the study of animal systems from the local to global arena, students will appreciate the use of animals and their contributions across diverse populations and understand the local and global impacts of the application of new technologies to the animal industries. In the laboratory activities, students reinforce concepts of the lecture and pursue a more in depth understanding of these concepts. As students are introduced to the studies of animal science, they will gain an appreciation of their role toward the advancement of domesticated animals, learn to recognize issues that concern the animal industries, and discover how to improve current human –animal relationships.

Course Description: A study of the basic principles of genetics, breeding, reproduction, nutrition, behavior, and biotechnology as it applies to the molecular, cellular, and physical underpinnings of domesticated animal form and function.

Animal Sciences H2300 Learning Outcomes:

Successful students will:

1. Be familiar with the historical, social, and biological contexts that govern the study of animals.
2. Understand basic principles of genetics, breeding, reproduction, nutrition, behavior, and biotechnology.
3. Appreciate the molecular, cellular, and physical underpinnings of animal form and function.
4. Develop the ability to critically evaluate concepts in science as they are applied to the study of animals.
5. Construct innovative approaches to, and solutions of, problems encountered when maintaining animals for human benefit.
6. Appreciate the uses of animals and social attitudes regarding how animals are used.
7. Have a broad understanding of biotechnology and it's uses toward advancing the health and well-being of animals
8. Consider positive and negative implications of applying modern technology to animal systems.

Lecture, Lab and Reading Schedule

Week	Topic	Text	Laboratory
1	Importance of domesticated animals to humans	Chapter 1	NO LAB See Canvas
2	Evolution of domesticated species and the process of their domestication	Chapter 2	Sheep handling and management considerations; shearing demonstration*
3	Animal Behavior and Welfare	Chapter 3 and 16	Waterman Tour*
4	Nutrition: nutrient requirements, physiology, and the importance of different digestive strategies.	Chapter 4	Anatomical observation of reproductive tracts; considerations for artificial insemination across species (emphasis on cows, sows, and hens)
5	Organization of biological systems from molecular structures to physical features.	Chapter 5	Considerations in the care and maintenance of horses
6	Genetics & application of genetics for animal breeding: natural versus artificial selection.	Chapter 5	Comparison of the digestive anatomy of various species with consideration of dietary strategies
7	Biotechnology: progress, applications and limitations.	Chapter 5	Evaluation of fluid milk and processed products**
8	Principles of reproduction and assisted reproductive technologies.	Chapter 6	NO LAB October 13
9	Lactation strategies: Nutritional and immunological support of the young.	Chapter 7	Poultry and egg evaluation
10	Animal form and function: Ruminants	Chapter 8 and 9	Mammary physiology; milk production; ruminant nutrition and calf care
11	Animal form and function: Small Ruminants & Pseudo-ruminants	Chapter 10 and 14	On-farm animal welfare audits
12	Animal form and function: Hind-gut fermenters	Chapter 12	Live evaluation of market pigs including ultrasound scanning for back-fat and loin eye area & AI-related procedures
13	Animal form and function: Simple nonruminants & Avians	Chapter 11 and 13	Carcass Fabrication; meat product demonstration; influence of cooking on quality †
14	Animal form and function: Aquatics	Chapter 15	NO LAB
15	Did we cover everything?		NO LAB
	Final Exam		

***** Laboratory will occur at animal facilities. Students will be transported by bus. Pick-up of students will occur in front of the Animal Sciences Building.

**Students will sample various dairy and dairy alternative products. Students with dairy, nut, or gluten allergies, sensitivities, or beliefs that preclude consumption of these products should notify their instructor so that arrangements can be made.

† Laboratory will take place in the Department of Animal Sciences Meat Laboratory. Dress warmly.

Evaluation Three exams will be given during the semester. Two lecture midterms worth 100 points each and a lecture final worth 150 points. ***Material taught in lectures is cumulative and essential themes and concepts taught during the course may appear on any exam***. Exams will be mixed format. ***Exams will not be returned***. The laboratory will consist of weekly assignments focused toward laboratory learning goals (50 points). There will be a written assignment where students consider controversies in Animal Sciences, evaluate the science behind the controversy, and develop critical synopsis of the research using peer reviewed journal references (100 points). A group project designed to allow students to explore resources available to pursue undergraduate research and to provide experience in a laboratory

environment will expand understanding of organ system structure and cellular function using basic histological techniques (100 points).

Evaluation	**POINTS**	
Exam I	100	SEPTEMBER 23(1:50-2:45)
Exam II	100	OCTOBER 28 (1:50-2:45)
FINAL EXAM	150	DECEMBER 16 (2:00-3:45)
Lab exercises and participation	50	WEEKLY
Written assignment (Controversies in Animal Sciences)	100	NOVEMBER 23 (IN CLASS)
Group project	100	DECEMBER 8
Total	**600**	

Grade Scale: Grades will be based on the total points earned as a percentage of total points possible and letter grades assigned as follows:

Percentage		Percentage	
93-100	A	73-76.9	C
90-92.9	A-	70-72.9	C-
87-89.9	B+	67-69.9	D+
83-86.9	B	60-66.9	D
80-82.9	B-	<60	E
77-79.9	C+		

SECRETS TO SUCCESS

Attend class regularly
Be an active participant in class activities
Ask if you need clarification
Review material after class
Prepare for exams in advance, do not wait until the last minute to study
Seek help early in the semester if you are having difficulty
Get to know other students in the class; they can be your best learning tool
Don't be afraid to venture into what is not familiar.

Course Management System This course is piloting Canvas (https://carmen.osu.edu & select the Canvas icon) to manage course content and grades. Students are expected to check this site frequently to receive updates regarding the course. Note, important information delivered during lecture may not be posted to Canvas and Canvas is not a substitute for class attendance.

As part of the Canvas pilot project you will receive requests to provide feedback on your experiences with Canvas. When solicited, please take the time to provide this valuable feedback that may shape the future direction of OSU Learning Management System.

Course Policies

Attendance Policy: Your are expected to attend class and be punctual. Attendance is not officially recorded, but may be considered in final grade decisions. If an emergency should warrant that a lecture be missed, prior notification should be given to the instructor. On dates of scheduled exams, the instructor must be contacted the day of the absence. In case of an illness, you must be seen by and ***receive written documentation from a professional health care provider on the day of the absence.*** Routine specialist appointments (optometrist, dentist, etc.) are not accepted as an excused absence for an exam. In instances of a ***death in the family, documentation in the form of a death certificate, obituary notice, or funeral remembrance card is required***. ***Request for excuse of absence for University sanctioned events must pre-approved by the instructor.*** You are responsible for submitting appropriate documentation for absences within two lecture periods from the absence.

Exam Policy: If you miss an exam and have a valid, documented excuse (as noted above in the attendance policy), you will be given an opportunity to attend a make-up exam. ***Make-up exams are available at 4:00 pm on the Friday following the regularly scheduled mid-term (SEPT 25 and OCT 30 for Exam I and Exam II, respectively). There are no alternative make-up exam dates.*** If your absence is not considered valid for missing an exam or if you do not attend the make-up exam date, you will receive a grade of 0. Validity of the excuse is up to the instructor's discretion. Missing an exam due to minor illness, transportation issues, faulty alarm clocks, etc. will result in a grade of zero. If you miss the final exam, you will receive an E for the course.

E-Mail Etiquette: The use of e-mail has made the classroom professor more approachable and accessible to the student. However, students should realize that e-mail should not always be used as a casual form of communication and professional relationships should be maintained when using e-mail for a class. Below I have included guidelines from Bloomsbury's guide on email etiquette that you should follow when drafting your e-mail. ***I will not respond to e-mails that I consider inappropriate. I will respond to appropriate emails in a timely manner, do not expect an immediate reply. If you require an immediate response consider visiting with me in person.***

DO

- Include a descriptive statement in the subject line.
- Use proper salutations when beginning an e-mail.
- Be concise in the body of the e-mail, use complete sentences and proper grammar.
- Use an appropriate closure at the end of each e-mail followed by your first and last name.
- If replying to an e-mail, reference the original e-mail and its content.
- Be selective of your choice of words. Emotions are difficult to convey in text and without the benefit of facial expressions your sentiment can be lost in the words you choose to write.

DON'T

- Use all capital letters; this conveys a tone of ANGER.
- Use e-mail as a format to criticize other individuals.
- Ask for your grade via e-mail. Grades will not be discussed by e-mail. If you need to discuss a graded item make an appointment to do so in my office.
- E-mail to inquire when grades will be posted. We will work toward submitting grades promptly, however, recognize that grading assignments and exams requires considerable time to ensure uniformity and fairness.
- Send an e-mail out of frustration or anger. Learn to save the e-mail as a draft and review at a later time when emotions are not directing the content.

Punctuality: Punctuality is a necessity as tardiness is disruptive to the entire class. Students who are repeatedly tardy are subject to a reduction in total points assessed toward the final grade.

Technology Devices: Use of electronic devices can be distractive to learning, not only for those using the devices but also for other students in the class. All portable communication devices must be turned ***OFF*** or placed in ***Etiquette Mode*** and stored out of sight during class period. You are permitted to use a tablet or related device to access or take notes during class. You are not permitted to use any electronic device to perform non-class related activities (social networking, instant messaging, checking email, surfing the internet, gaming, etc.). Should the use of accepted electronic devices become a distraction to other students or should it be found that the devices are used for non-class related activities; the further use of such devices will be prohibited. The use of electronic devices is strictly prohibited during exams.

Respecting Intellectual Property: Course materials are the property of the instructors. Students may not distribute provided course material, except to other students enrolled within the same course, without the permission of the instructor. Course material includes, but is not limited to, lecture documents, written or transcribed notes, video or audio recordings, etc. You must receive written permission from the instructor prior to recording lectures.

University Policies

Disability Services: Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; http:/www.ods.ohio-state.edu/.

Academic Misconduct: Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me or visit oaa.osu.edu/coam/home.html.

ANIM SCI H2300: Honors Introductory Animal Sciences
AUTUMN Semester, 2017

Lecture: Monday, Wednesday and Friday; 1:50-2:45am, 202 Animal Sciences Building
Recitation: Thursday; 1:50-2:45pm, 107 Plumb Hall

Instructor: Pasha A Lyvers Peffer, Department of Animal Sciences
lyvers-peffer.1@osu.edu, 292-3896
Office hours: Tuesday, 11:00-12:30 & Wednesday, 12:30-1:30.

Recitation
Ann Ottobre, Department of Animal Sciences
ottobre.1@osu.edu, 292-7135

Assistants:

Prerequisites: Honors standing, or permission of instructor. Not open to students with credit for 2200.01. GE Nat Sci Bio course.

Text: Required: ANIMAL SCIENCES, Peffer and Day. Kendall Hunt Publishing; Dubuque, IA:2014. ISBN-10: 1465250107; ISBN-13: 978-1465250100

Goals and Objectives: Introductory Animal Sciences is a Natural Science (Biological Science), general education, course that promotes an understanding of modern science through a biological systems based approach. Students learn of the relationship between science and technology, consider the implications of scientific discoveries, and acquire the knowledge and critical thinking skills required to evaluate the potential of science and technology to address problems from a global arena as they pertain to domestic animals used for human benefit.

Learning Objectives:

Successful students will

1. appreciate the evolution, domestication, and production of animals
2. relate structure, form and function, growth and development of animal systems from the cellular to the organismal level.
3. demonstrate knowledge of animal well-being, anatomy, physiology, genetics, nutrition, and reproduction.
4. reflect on the chemical and biological underpinnings of animal products

How students meet objectives through this course: The course embodies fundamental concepts in areas of genetics, reproduction, nutrition, behavior, and biotechnology. Students are introduced to the molecular and cellular mechanisms that underscore the function of biological systems and how knowledge in this area supports animal use and products. Students will consider how the study of animals has advanced from early scientific discoveries. Through the study of animal systems from the local to global arena, students will appreciate the use of animals and their contributions across diverse populations.

Course Description: A study of the basic principles of genetics, breeding, reproduction, nutrition, behavior, and biotechnology as it applies to the molecular, cellular, and physical underpinnings of domesticated animal form and function.

Goals and Objectives of the GE Natural Science Category: Courses in natural sciences foster an understanding of the principles, theories and methods of modern sciences, the relationship between science and technology, and the effects of science and technology on the environment.

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students learn key events in the history of science.
3. Students provide examples of the inter-dependence of scientific and technological developments.
4. Students discuss social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world

How students meet the GE Natural Science objectives through this course: Students will learn how systematic observations of the natural world have helped define current concepts of science and the role of controlled experimentation in support of early scientific theories through discussions of behavior. An understanding of the foundations of modern science will be acquired through discussions of cell theory, heredity, physiological ecology, energy transfer, and evolutionary strategies of todays domesticated species. Students will gain an appreciation of how human intervention has shaped animal form and function throughout history and the role of technology; addressing the implications of biotechnologies current and future applications.

Lecture, Lab and Reading Schedule

Week	Topic	Text	Assignment Due
1	Importance of domesticated animals to humans	Chapter 1	
2	Evolution of domesticated species and the process of their domestication	Chapter 2	
3	Animal Behavior and Welfare	Chapter 3 and 16	
4	Nutrition: Role, function, and requirements of nutrients and an introduction to metabolism and thermoregulation	Chapter 4	
5	Nutrition: physiology, and the importance of different digestive strategies. ***(XXX: Last day to drop the course without receiving a W)***	Chapter 4	***SEPT 21-EXAM I***
6	Organization of biological systems from molecular structures to physical features. The chemical & biological hierarchy of living systems.	Chapter 5	
7	Genetics & application of genetics for animal breeding: natural versus artificial selection.	Chapter 5	
8	Genetics continued Biotechnology: progress, applications and limitations.	Chapter 5	
9	Principles of reproduction and assisted reproductive technologies.	Chapter 6	***OCT 19-EXAM II***
10	Lactation strategies: Nutritional and immunological support of the young. ***(XXX: Last day to drop the course and receive a W)***	Chapter 7	
	Food & Fiber: Eggs		
11	Food & Fiber: Milk		
12	Food & Fiber: Muscle to Meat		***NOV 16-EXAM III***
13	Food & Fiber: Fiber		NOV 23-Written Assign.
14	Did we cover everything?		DEC 8-Group Project
15	**FINAL EXAM**		***DEC 17-FINAL***

Evaluation Four exams will be given during the semester. Three lecture midterms worth 100 points each and a lecture final worth 150 points. ***Material taught in lectures is cumulative and essential themes and concepts taught during the course may appear on any exam***. Exams will be mixed format. ***Exams will not be returned***. There will be a written assignment where students consider controversies in Animal Sciences, evaluate the science behind the controversy, and

develop critical synopsis of the research using peer reviewed journal references (100 points). A group project designed to allow students to explore resources available to pursue undergraduate research and to provide experience in a laboratory environment will expand understanding of organ system structure and cellular function using basic histological techniques (100 points).

Evaluation	**POINTS**	
Exam I	100	SEPTEMBER 21(1:50-2:45)
Exam II	100	OCTOBER 19 (1:50-2:45)
Exam III	100	NOVEMBER 16 (1:50-2:45)
FINAL EXAM	150	DECEMBER 16 (2:00-3:45)
Written assignment (Controversies in Animal Sciences)	100	NOVEMBER 23 (IN CLASS)
Group project	100	DECEMBER 8
Total	**600**	

Grade Scale: Grades will be based on the total points earned as a percentage of total points possible and letter grades assigned as follows:

Percentage		Percentage	
93-100	A	73-76.9	C
90-92.9	A-	70-72.9	C-
87-89.9	B+	67-69.9	D+
83-86.9	B	60-66.9	D
80-82.9	B-	<60	E
77-79.9	C+		

SECRETS TO SUCCESS

Attend class regularly
Be an active participant in class activities
Ask if you need clarification
Review material after class
Prepare for exams in advance, do not wait until the last minute to study
Seek help early in the semester if you are having difficulty
Get to know other students in the class; they can be your best learning tool
Don't be afraid to venture into what is not familiar.

Course Management System This course uses Carmen (http://carmen.osu.edu) to manage course content and grades. Students are expected to check this site frequently to receive updates regarding the course. Note, important information delivered during lecture may not be posted to Carmen and Carmen is not a substitute for class attendance.

Content: Download and print a copy of the course notes prior to attending class. These notes do not represent a full copy of the lecture notes – but an abridged version to facilitate note taking during lectures. You must attend lectures to obtain the material required to complement these slides.

Grades: Mid-term Exams and quiz grades are displayed in Carmen. You should keep record of your course grades and this syllabus to determine your overall course grade and the associated letter grade.

Course Policies

Attendance Policy: Your are expected to attend class and be punctual. Attendance is not officially recorded, but may be considered in final grade decisions. If an emergency should warrant that a lecture be missed, prior notification should be given to the instructor. On dates of scheduled exams, the instructor must be contacted the day of the absence. In case of an illness, you must be seen by and ***receive written documentation from a professional health care provider on the day of the absence.*** Routine specialist appointments (optometrist, dentist, etc.) are not accepted as an excused absence for an exam. In instances of a ***death in the family, documentation in the form of a death certificate, obituary notice, or funeral remembrance card is required. Request for excuse of absence for University sanctioned events must pre-approved by the instructor.*** You are responsible for submitting appropriate documentation for absences within two lecture periods from the absence.

Exam Policy: If you miss an exam and have a valid, documented excuse (as noted above in the attendance policy), you will be given an opportunity to attend a make-up exam. ***Make-up exams are available at 4:00 pm on the Friday following the regularly scheduled mid-term (SEPT 23 and OCT 21, and NOV 18 for Exam I , II, and III respectively). There are no alternative make-up exam dates.*** If your absence is not considered valid for missing an exam or if you do not attend the make-up exam date, you will receive a grade of 0. Validity of the excuse is up to the instructor's discretion. Missing an exam due to minor illness, transportation issues, faulty alarm clocks, etc. will result in a grade of zero. If you miss the final exam, you will receive an E for the course.

E-Mail Etiquette: The use of e-mail has made the classroom professor more approachable and accessible to the student. However, students should realize that e-mail should not always be used as a casual form of communication and professional relationships should be maintained when using e-mail for a class. Below I have included guidelines from Bloomsbury's guide on email etiquette that you should follow when drafting your e-mail. ***I will not respond to e-mails that I consider inappropriate. I will respond to appropriate emails in a timely manner, do not expect an immediate reply. If you require an immediate response consider visiting with me in person.***

DO

- Include a descriptive statement in the subject line.
- Use proper salutations when beginning an e-mail.
- Be concise in the body of the e-mail, use complete sentences and proper grammar.
- Use an appropriate closure at the end of each e-mail followed by your first and last name.
- If replying to an e-mail, reference the original e-mail and its content.
- Be selective of your choice of words. Emotions are difficult to convey in text and without the benefit of facial expressions your sentiment can be lost in the words you choose to write.

DON'T

- Use all capital letters; this conveys a tone of ANGER.
- Use e-mail as a format to criticize other individuals.
- Ask for your grade via e-mail. Grades will not be discussed by e-mail. If you need to discuss a graded item make an appointment to do so in my office.
- E-mail to inquire when grades will be posted. We will work toward submitting grades promptly, however, recognize that grading assignments and exams requires considerable time to ensure uniformity and fairness.
- Send an e-mail out of frustration or anger. Learn to save the e-mail as a draft and review at a later time when emotions are not directing the content.

Punctuality: Punctuality is a necessity as tardiness is disruptive to the entire class. Students who are repeatedly tardy are subject to a reduction in total points assessed toward the final grade.

Technology Devices: Use of electronic devices can be distractive to learning, not only for those using the devices but also for other students in the class. All portable communication devices must be turned ***OFF*** or placed in ***Etiquette Mode*** and stored out of sight during class period. You are permitted to use a tablet or related device to access or take notes during class. You are not permitted to use any electronic device to perform non-class related activities (social networking, instant messaging, checking email, surfing the internet, gaming, etc.). Should the use of accepted electronic devices become a

distraction to other students or should it be found that the devices are used for non-class related activities; the further use of such devices will be prohibited. The use of electronic devices is strictly prohibited during exams.

Respecting Intellectual Property: Course materials are the property of the instructors. Students may not distribute provided course material, except to other students enrolled within the same course, without the permission of the instructor. Course material includes, but is not limited to, lecture documents, written or transcribed notes, video or audio recordings, etc. You must receive written permission from the instructor prior to recording lectures.

University Policies

Disability Services: Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; http:/www.ods.ohio-state.edu/.

Academic Misconduct: Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me or visit oaa.osu.edu/coam/home.html.

Every effort has been made to provide clear and accurate information within this syllabus. Should events require that information contained herein must be modified, announcements will be made in class. It is your responsibility to acquire any information provided during times of absence.

EXPECTED LEARNING OUTCOMES OF ANIMSCI 2300H: NATURAL SCIENCE: BIOLOGICAL

Introductory Animal Sciences is a Natural Science (Biological Science), general education, course that promotes an understanding of modern science through a biological systems based approach. Students learn of the relationship between science and technology, consider the implications of scientific discoveries, and acquire the knowledge and critical thinking skills required to evaluate the potential of science and technology to address problems from a global arena as they pertain to domestic animals used for human benefit.

Goals and Objectives of the GE Natural Science Category: Courses in natural sciences foster an understanding of the principles, theories and methods of modern sciences, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world.

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students understand key events in the development of science and recognize that science is an evolving body of knowledge.
3. Students describe the inter-dependence of scientific and technological developments.
4. Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

How students meet the GE Natural Science objectives through this course: Students will learn how systematic observations of the natural world have helped define current concepts of science and the role of controlled experimentation in support of early scientific theories through discussions of evolution, behavior, reproduction, nutrition, and genetics. An understanding of the foundations of modern science is acquired through discussions of cell theory, heredity, physiological ecology, energy transfer, and evolutionary strategies of todays domesticated species. Students will gain an appreciation of how human intervention has shaped animal form and function throughout history and the role of technology; addressing the implications of biotechnologies current and future applications.

Animal Sciences – Introductory Animal Sciences {ANIMSC-2200.01}

Expected Learning Outcomes Assessment Plan

Course Goals	**GE Learning Goals** *broad descriptive statements of what students are to be able to do, know, and care about upon the completion of the course*	Supporting/Contributing **Outcomes** *detailed descriptions of what a student must be able to do to reach a goal under the specific conditions*	**Measures** – Means/Methods *the method or means by which the quality of student learning for each goal and associated outcome will be measured and assessed*					**Criteria** *the standards the course will use to evaluate the quality of student learning for each goal and associated outcome*
				embedded testing, exercise, or activity to serve as authentic assessment method			*relevant topic or reference to course element*	
Promote an understanding of modern science through a biological systems based approach Knowledge	1.0 Students understand the principles, theories, and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the	1.1 understand the basic facts, principles, theories and methods of modern science	1.1.1	Direct	Embedded testing (Appendix A)	Midterm 1 & Comprehensive Final Exam: Identified question set	Comparison of midterm questions to final exam questions for learning gains for key concepts tested: 1) evolutionary theory ; 2) interpretation of science findings	Acceptable criteria is students will demonstrate 25% gain above initial scores obtained for identified problem set
			1.1.2	Indirect	Self-evaluation of learning	Course survey	As a result of this class, how has your understanding of science changed What was the most valuable scientific concept	Acceptable criteria is 70% of students perceive increased understanding of modern science concepts

	contemporary world.						learned from this class	
		1.2 understand key events in the development of science and recognize that science is an evolving body of knowledge	1.2.1	Direct	Essay (Appendix B)	Written assignment	students consider controversies in Animal Sciences, evaluate the science behind the controversy, and develop critical synopsis of the research using peer reviewed journal references	Acceptable criteria is 80% of students average a score of Proficient or higher on associated grading rubric
			1.2.2	Direct	Embedded testing	Midterm 2 & Final Comprehensive Exam: Identified question set	Comparison of midterm questions to final exam questions for learning gains for key concepts tested: 1) contributions of early scientist (Aristotle, Hooke, Darwin, Watson & Crick) and	Acceptable criteria is students will demonstrate 25% gain above initial scores obtained for identified problem set

							current concepts in science	
			1.2.3	Indirect	Self-evaluation of learning	Course survey	As a result of this class, how has your understanding of science changed What was the most valuable scientific concept learned from this class	Acceptable criteria is 70% of students perceive increased understanding of modern science concepts
		1.3 describe the inter-dependence of scientific and technological developments	1.3.1	Direct	Group project (Appendix C)	Class presentation	undergraduate research in the exploration of organ system structure and cellular function using basic histological techniques	Acceptable criteria is 80% of students score Meet Expectations or higher on associated rubric
			1.3.2	Direct	Embedded testing	Midterm 2 & 3 & Final Comprehensive Exam: Identified question set	Comparison of midterm questions to final exam questions for learning gains for key concepts tested: 1) value of technology to understanding	Acceptable criteria is students will demonstrate 25% gain above initial scores obtained for identified problem set

						and improving animal systems	
		1.3.3	Indirect	Self-evaluation of learning	Course survey	What was the most valuable scientific concept learned from this class As a result of this class, how has your understanding of science changed	Acceptable criteria is 70% of students perceive increased understanding of modern science concepts
	1.4 recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world	1.4.1	Direct	Essay	Written assignment	students consider controversies in Animal Sciences, evaluate the science behind the controversy, and develop critical synopsis of the research using peer reviewed journal references	Acceptable criteria is 80% of students average a score of Proficient or higher on associated grading rubric
		1.4.2	Direct	Embedded testing	Midterm 1,2, & 3 & Final Comprehensive Exam:	Comparison of midterm questions to final exam questions for learning gains	Acceptable criteria is students will demonstrate 25% gain above initial

					Identified question set	for key concepts tested: 1) Science, application, and controversy of animal welfare, biotechnology, reproductive technology	scores obtained for identified problem set
		1.4.3	Indirect	Self-evaluation of learning	Course survey	As a result of this class, how has your understanding of science changed	Acceptable criteria is 70% of students perceive increased understanding of modern science concepts
						What was the most valuable scientific concept learned from this class	

Use of assessment findings: Systematic review of course outcomes will occur through data collection and analysis of direct and indirect measures of expected learning outcomes. Data collection for identified direct measures of the associated learning outcomes is conducted each term the course is taught, and annual data of identified measures is summarized and reported as evidence of achievement or need for improvement. With the goal of improving instruction and student learning, indicators of the findings will be used to plan and incorporate strategic adjustments to the course for continuous quality improvement. Emphasis will be placed on goals and associated outcomes for which students failed to meet the minimal acceptable criteria. Teaching and associated assessment measures for which goal achievement is determined will be examined for coherency in enabling the student to achieve learning potential. Assessment data is communicated and shared through an OSU authenticated share site (box.osu.edu).

APPENDIX A: *SAMPLE* EMBEDDED QUESTIONS

ELO 1: Students understand the basic facts, principles, theories and methods of modern science.

- Key concepts tested: 1) evolutionary theory ; 2) interpretation of science findings

1. The symbiotic relationship between ruminants and the microorganisms that inhabit their digestive system can be viewed as one of _____, whereby both systems benefit from one another.

2. According to the theory of evolution:

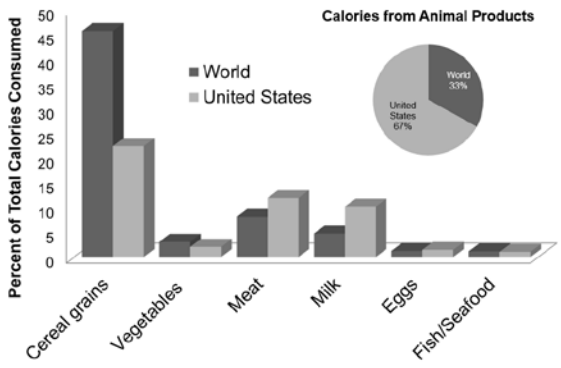
   a. Successful organisms emerge through modifications that increase chances of survival
   b. Species can be artificially selected for in the creation of new variations
   c. Species resist change over time and space due to limited ability to vary morphologically
   d. Species reproduce optimally under limited food and lack of habitat
   e. To ensure optimal conditions, species reproduce below environmental capacity

3. Natural selection:

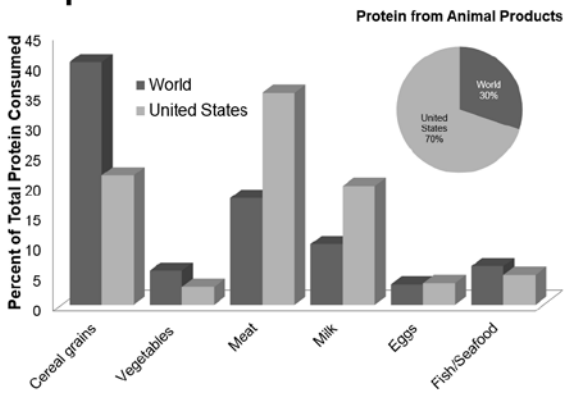
   a. Introduces variation
   b. Acts on existing variation
   c. Increases the likelihood of a genetic modification
   d. Decreases the likelihood of a genetic modification

4. Consider the contributions of animal products to world and US food supply and select the response(s) that represent these contributions.

Total calories consumed



Total protein consumed



a. Animal products contribute to a greater percentage of total protein than total calories to world food supply.
b. Animal products contribute a greater percentage of total calories than total protein to world food supply.
c. Animal products contribute approximately equal percentage of protein and calories to world food supply.
d. Animal products contribute a lesser percentage of protein to food supply in the US as compared to their contribution to world food supply.

e. Animal products contribute a greater percentage of calories to food supply in the US as compared to their contribution to world food supply.

ELO 2: Students understand key events in the development of science and recognize that science is an evolving body of knowledge.

- Key concepts tested: 1) contributions of early scientist (Aristotle, Hooke, Darwin, Watson & Crick) and current concepts in science

1. The modern cell theory states (select all true):

   a. All living things are composed of cells
   b. All cells come from preexisting cells
   c. The cell is the fundamental unit of structure in living systems
   d. The cell is the fundamental unit of function in living systems

2. The primary phases of the cell cycle:

   a. Interphase b. Prophase c. Metaphase
   d. Anaphase e. Telophase f. Mitotic phase

3. According to the complementary base pairing rules of nucleic acids, the following nucleic acid bond pairings would occur (select all that are true):

   a. Adenine: Guanine b. Adenine: Uracil
   c. Thymine: Cytosine d. Cytosine: Guanine
   e. Uracil: Thymine f. Uracil: Guanine

4. Aristotle proposed two theories of embryogenesis. One of the theories later became known as epigenesis. Select the statement that defines or supports the theory.

   a. The embryo is a preformed being that grows during development
   b. A living being arises from the successive differentiation of a formless being
   c. Single cells isolated from the male are capable of developing into an embryo
   d. a and b
   e. b and c
   f. a and c

5. Cellular _____ is necessary for embryonic development, postnatal growth, and tissue renewal and occurs through _____. _____ is the process whereby cells acquire specific function necessary to organismal processes.

   a. Proliferation, Mitosis, Differentiation
   b. Differentiation, Mitosis, Proliferation
   c. Proliferation, Meiosis, Differentiation
   d. Differentiation, Meiosis, Proliferation

ELO 3: Students describe the inter-dependence of scientific and technological developments.

- Key concepts tested: 1) value of technology to understanding and improving animal systems

1. With agriculture, milk availability for human consumption increased and led to milk as a dietary staple for the adults of some cultures. What occurred to account for the ability of early humans to drink milk beyond infancy?

   a. Loss-of-function mutation contributing to lactase persistence
   b. Gain-of-function mutation contributing to lactase persistence
   c. Gain-of-function mutation contributing to lactose persistence
   d. Loss-of-function mutation contributing to lactose persistence

2. In biological systems, the potential energy of transformation is measured by calorimetry. Which of the following describes the relationship between calorimetry and the energy factors of feedstuffs (select all correct)?

   a. Calorimetry provides a measure of gross energy, or the potential energy available to the organism when chemical bonds of the nutrients are broken
   b. Calorimetry provides a measure of digestible energy, or the potential energy available to the organism when energy losses through nitrogenous waste compounds are considered
   c. Calorimetry provides a measure of metabolizable energy, or the potential energy available to the organism when energy losses associated with undigested feeds of the GI tract and nitrogenous waste compounds are considered
   d. Calorimetry provides a measure of net energy, or the potential energy available to the organism when energy losses associated with undigested feeds of the GI tract and heat of fermentation are considered

3. Consider the inheritance of alleles responsible for coat color in cattle. If you bred a red shorthorn female to a white shorthorn male, what coat color/pattern would you predict for the off-spring if the trait was controlled by incomplete dominance:

   a. The coat color of the progeny would be dilute red
   b. The progeny would have a roan coat pattern
   c. The coat color of the progeny would be white
   d. Male progeny would have a red coat color while females would display the white coat color
   e. Female progeny would have a red coat color while males would display the white coat color

4. Artificial insemination is a widely used reproductive technology. To improve use in beef cattle, estrus synchronization is often employed. Which of the following describes a method used in estrus synchronization:

   a. Injection of GnRH and regression of the corpus luteum
   b. Injection of luteinizing hormone and regression of the corpus luteum
   c. Insertion of a controlled estrogen release device and suppression of estrus
   d. Insertion of a controlled progesterone release device and suppression of estrus

ELO 4: Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

- Key concepts tested: 1) Science, application, and controversy of animal welfare, biotechnology, and reproductive technology

1. Abnormal behavior in captive animals occurs when behavior of exploration is suppressed. In laying hens, feather pecking is considered an abnormal behavior with the incidence increasing in confined flocks. The incidence of feather pecking is reduced by animal selection and enrichment practices.

   a. The paragraph contains one incorrect sentence.
   b. The paragraph contains two incorrect sentences.
   c. The paragraph contains three incorrect sentences.
   d. The paragraph is correct.

2. Why is embryo transfer used in cattle?

   a. To increase use of superior genetics of elite females
   b. Increase capacity to use semen of deceased sires
   c. Safety due to aggressiveness of female cattle
   d. To reduce costs of pregnancy in each recipient
   e. To induce lactation in the donor

3. Gradual involution of the mammary gland follows peak lactation. Involution involves the degeneration and/or loss of secretory epithelial cells and associated alveoli. Administering growth hormone will prevent involution.

   a. The paragraph contains one incorrect sentence
   b. The paragraph contains two incorrect sentences
   c. The paragraph contains three incorrect sentences
   d. The paragraph is correct

4. Interbreeding between two animal species yields unique offspring, but these offspring are often sterile, maintaining the genetic distinction of the parents. What process in meiosis is responsible for the sterility observed in these hybrid animals

   a. Crossing-over of chromosomal DNA
   b. Mutations of chromosomal DNA
   c. Homologous chromosome pairing
   d. DNA replication failure

APPENDIX B: WRITTEN ASSIGNMENT SCORING RUBRIC

Introductory Animal Sciences (ANIM SCI 2300H) GRADING RUBRIC

Name (First Last.#): _____Total Points Earned: _____

Each element of this assignment is evaluated using the following 5-point scale:

0 or 1 = Poor (not addressed or evident)
2 = Sufficient (attempt made but some errors or incorrect assumptions occurred in the analysis)
3 = Efficient (attempt made with good results, minor additional work, elaboration, or refinement needed)
4 = Proficient (issue accomplished; no further work needed)
5 = Advanced (well exceeds expectations)

Elements are evaluated on a 5- 4-3-2-1 basis. Total rubric points are converted to a percent based on total possible and a numerical grade assigned.

When evaluating the quality of each element, the following rubric (adapted from UC Davis English Department) is used. If you are unfamiliar in scientific writing, use the *Scientific Style Guide*.

	Ideas	*Organization*	*Support*	*Writing Effectiveness*	*Mechanics*
5	Interesting, demonstrates thought, central ideas are clear	Reader is guided through chain of reasoning through logical flow of ideas.	Provides sufficient evidence to support ideas	Clearly structured sentence style, focused.	Almost entirely free of spelling, punctuation, and grammatical errors
4	Responds to assignment without critical flaws in ideas. Minor lapse in development of topics	Some logical links between ideas may be unclear, but attempts to transition between topics	Ideas may not be fully supported.	May be too general, but sentences are generally clear and well structured.	May contain a few errors, which annoy the reader, but do not impede understanding
3	Adequate, but weaker and less effective at responding to the assignment. Shows basic understanding of assignment.	Lacks logical structure which interferes with readers understanding. Logic is not always clear.	Uses generalizations to support main points or may use personal experiences or opinions. Lapse in logic.	Incorrect uses or words. Sentences appear wordy, unfocused, repetitive, or confusing	Several errors which may initially confuse the reader but do not impede overall understanding
2	Does not have clear, central idea. Lacks focus, too vague, flaws in comprehension of sources. May be too general or too specific to be effective.	Lacks internal paragraph coherence and may contain improper or inappropriate transitions.	Depends on overgeneralizations for support or offers little evidence to support ideas. May be personal in nature.	May be very personal and specific. Contains several awkward sentences and structure is monotonous.	May contain many errors, or few that block the reader's understanding and ability to see connections between ideas.
1	Does not address assignment, lacks a central idea and may not use sources to support ideas.	No appreciable organization; lacks transitions and coherence.	Uses irrelevant details or lacks supporting evidence.	Contains multiple awkward sentences and misuse of words.	Difficult to follow the logic from sentence to sentence due to multiple errors.

APPENDIX C: GROUP PRESENTATION SCORING RUBRIC

SCORING RUBRIC FOR ANIMSCI 2300H PRESENTATION

Student Name: _____
Date: _____
EVALUATOR: _____

Explanation of Ranking:
Exceeds Expectations: Student goes above and beyond expectations (e.g. has a clear and advanced understanding of the current state of knowledge and implications of their findings).
Meets Expectations: Student meets the requirements. (e.g organized, understands basic concepts, provides adequate understanding of implications of their findings)
Meets Some Expectations: Student has fulfilled some of the requirements (e.g. shows incomplete or partially incorrect understanding of concepts; implications of findings is weak).
Does Not Meet Expectations: Student does not grasp requirements (e.g. lack of understanding concepts and implications of findings).
For each attribute please select a ranking (checkmark a box).

Overall rating *Check one of the following as your overall assessment.* Final Comments (Please provide comments on strengths and weaknesses of the student)	❒Exceeds Expectations	❒Meets Expectations	❒ Meets Some Expectations	❒Does not meet Expectations
	Final Comments:			

Criteria	Exceeds Expectations	Meets Expectations	Meets Some Expectations	Does not meet Expectations
Demonstrated ability to describe and relate understanding of cell and organism structure/function				
Demonstrated comprehension of how methods of science increase understanding of animal systems				
Related implications of findings				
Sufficiently supported discussion of findings through use of scientific literature				
Totals: tally each expectation column.				