Animal Science 101
Principles of Animal Science
FALL 2009

Instructor: Wes Schager
Email: wschager@csuchico.edu
Office: Plumas 203A
Phone: 898-6250

Lab Co-instructor: Clay Carlson
Email: ccarlson2@csuchico.edu
Office: Plumas 202
Phone: 898-6694

Class Schedule:
MW 9:00-9:50 – Lecture
Room: HOLT 170 (lecture only)

Lab Schedule:
Section 2: T 11:15 – 1:50
3: R 11:15 – 1:50
4: R 2:15 – 4:50
41: T 2:15 – 4:50
Location: FARM 003 (unless alternate location announced.) See attached directions to the University Farm.

Office Hours: Mon. 10 -11 am; Wed. 10:00 am – 1:00 pm. Please do not hesitate to ask me for an appointment if these times do not work for you. I am here to help you learn!

Text: Introduction to Animal Science. Global, Biological, Social and Industry Perspective. W. Stephen Damron. 4th Edition. (If you have a 3rd edition it will be fine.) There will be a copy of the text on reserve at the library.

Computer Use: Communication for this course will be conducted via WebCT Vista. This includes email communications and course announcements. It is the student’s responsibility to check WebCT regularly for any announcements regarding the course. If an activity or lab is not posted to WebCT by 6 pm of the day before that lab/activity; the instructor will bring copies to class.

Labs
- Labs are mostly held out at the University Farm. If you don’t have transportation, I will help you facilitate a ride during the first week of class. I will not accept the excuse that you didn’t come to lab because you didn’t have a ride! Let me know if you need help finding a ride. It has never been a problem with any of my past students.

- Laboratory Manual: Lab handouts will be posted on Vista prior to lab. Students are expected to download and bring lab handouts to each lab.

Course content: An overview of principles of Animal Science and the interrelationships of domestic animals and mankind. The course introduces some basic biology of animals including cell function, genetics, anatomy and physiology, reproduction, nutrition, animal health and disease, animal products, and animal behavior. The laboratory component will provide hands-on animal experiences to complement the lecture.
Statement of Student Learning Objectives/Outcomes (SLO’s)

Area B2 Goals (from EM 99-05):
1. Students must demonstrate an introductory understanding of fundamental concepts of life science as illustrated in plants and animals, or the course must emphasize these concepts in a study of some specific part of the life sciences. Examples are:
   a. students will be able to describe the basic cell function
   b. students will be able to describe basic cell division
   c. students will be able to understand basic genetic theory
   d. students will be able to understand basic concepts in gene expression
2. Students must have a laboratory component or similar activity in the life science and inquire into the life forms of the universe.
   Students will demonstrate understanding and appreciation of the methodologies of the natural science as investigative tools and the limitation of scientific inquiry.
   a. students will be able to demonstrate basic techniques in biotechnology
   b. students will be able to demonstrate basic techniques in hematology
   c. students will be able to demonstrate basic microbiological techniques
   d. students will be able to demonstrate basic techniques in small animal restraint
   e. students will be able to demonstrate basic data collection procedures
   f. students will be able to demonstrate basic skill in live and post-mortem animal evaluation
   g. students will meet (at minimum) the GE writing requirements

Grading

Quizzes (50 pts each: 7 will be taken: no make-ups) 350
   • Quizzes will usually be given during lab
   • Quizzes will cover two weeks of material/including lab material and reading
Laboratory exercises (completed during each lab session) 150
Research Project Work
   (Preliminary writing assignments, paper, participation) 150
Attendance (Quizzes; Homework Assn.) 100
No Comprehensive Final – last quiz given at scheduled final

Total (Approx) 750 pts

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>≥ 93%</td>
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<tr>
<td>B</td>
<td>≥ 83%</td>
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<tr>
<td>C</td>
<td>≥ 73%</td>
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<tr>
<td>D</td>
<td>≥ 60%</td>
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<tr>
<td>A-</td>
<td>≥ 90%</td>
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<td>B-</td>
<td>≥ 80%</td>
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<td>C-</td>
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<td>F</td>
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<tr>
<td>B+</td>
<td>≥ 87%</td>
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<tr>
<td>C+</td>
<td>≥ 77%</td>
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<tr>
<td>D+</td>
<td>≥ 67%</td>
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Remember—students earn grades, teachers merely assign them, do your best at all times.
Quizzes
Quizzes will be given at the beginning of each lab session and will cover the previous two week’s lecture and laboratory information. Punctuality is important to ensure that each student has the maximum amount of time to complete the quiz. Makeup-quizzes will only occur if pre-arranged with the professor.

Recording of scores
If a student feels an error in grading has been made, the student has one week from the time of the assignment is returned to them (or the grade is posted on the web, whichever is later) to request a review of the grade. You should retain all graded items until a final course grade is assigned.

Course Policies:

Student Responsibility
- Students are strongly advised not to miss class or labs since this time may be difficult or impossible to make up.
- It is the student’s responsibility to inform the instructor and arrange for alternate assignments when a class is missed for an excused reason such as illness or academic field trip.
- Students are expected to pay attention and participate in class meetings.
- It is the student’s responsibility to meet all appropriate deadlines for adding, withdrawing, etc. These deadlines can be found on the University web site at: http://www.csuchico.edu/schedule/
- No assignments will be accepted after the assigned due date without prior permission of the instructor.
- Unstapled assignments – multiple page assignments without a staple will receive a score of 0.
- Use of tobacco products is not allowed during class or lab.
- Students are expected to turn off all pagers, cell phones, ipods, mp3 players, and other electronic devices during class time. Headsets and ear buds should be removed at the beginning of class or lab.
- All class participants are expected to exhibit respectful behavior to other students and the instructor.
- All students have the right and privilege to learn in the class, free from harassment and disruption.
- Inappropriate or disruptive behavior will not be tolerated, nor will lewd or foul language.
- The class follows the standards set in the Code of Students Rights and Responsibilities (EM 96-38) and students are subject to disciplinary action for violation of that code.
- Courses in agriculture commonly include activities where potential hazards exist. Students are expected to conduct themselves in a safe manor at all times.

Plagiarism Detection
The campus subscribes to the Turnitin.com plagiarism prevention service, and you may be required to submit written assignments to Turnitin.com. Your work will be used by Turnitin.com for plagiarism detection and for no other purpose.
University Policies
University policies will be enforced in the course (see the catalog for a list of university policies).

Final Exams
All classes are required to meet for one two-hour period during finals week for instruction or examination. Most classes meet in their normal room according to the special schedule listed on the University web site. Your final will be your last quiz and will be held during the scheduled final time. It is not cumulative.

Cheating and Plagiarism
Cheating and plagiarism are considered as the most serious offenses in the teaching-learning process, as it erodes the integrity of the student/faculty relationship. Students are reminded that the University Policy on Academic Honesty will be enforced in this class. The policy is available in the Catalog. Students are reminded that turning in someone else’s homework or project is considered cheating. Students working together on individual assignments (ex. homework) are reminded to do their own work and turning in essentially identical work as another student is not acceptable.

If there is evidence that you have been involved in any form of academic dishonesty, you will receive an “F” grade for the course, be locked from Vista, and a report will be provided to Student Judicial Affairs for further action.

Students with Disabilities:
Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. (Contact Disability Support Services)

Academic Rigor
Academic rigor means the consistent expectation of excellence and the aspiration to significant achievement. It should pervade the entire atmosphere of the University--teaching and learning, curriculum, evaluation of student and faculty, outreach, admissions, advising, and student life.

Rigorous Learning
Rigorous students are part of the equation of rigorous teaching and learning. A rigorous education is vigorous, difficult, deeply satisfying work, and it requires a lifestyle conducive to achieving excellence. College is not a temporary diversion or a period of entertainment, but a fundamental piece of student character, citizenship, and employment future. A diploma and good grades from a demanding institution count for something. Rigorous students

- Set high personal standards, develop a strong sense of purpose, come to class well prepared, and complete assignments on time.
- Develop an effective relationship with the instructor, in and outside of class, and make the most of University advising and other services.
- Treat fellow students and the classroom environment with complete respect. Give each class full attention and participation. Do not miss class, arrive late, or leave early.
- Accept continuing responsibility for learning and for grades earned.
• Approach each class in a professional manner, as if the class were real employment. Treat a full-course load as full-time work and spend no less time on it. Determine exactly what is expected.
• Experiment with all teaching and learning strategies used in classes, and also determine which work best for them.
• Demonstrate complete honesty and integrity.

Rigorous Teaching
Rigorous faculty are role models for the behaviors and accomplishments the University seeks to promote. They demonstrate a high level of professionalism and commitment to the University and to their discipline and inspire in students an excitement about learning. Guiding students toward excellence, they
• Communicate high expectations and demonstrate them through a demanding syllabus and well-prepared classes.
• Encourage student-faculty contact in and out of class and offer conscientious advising and consistent availability.
• Encourage collaboration and active learning, fully involving students in the learning experience.
• Provide students early, prompt, and frequent feedback and develop appropriate assessment strategies.
• Emphasize time on task, clearly communicate time required for learning, make it clear that full-time study is full-time work, and design learning experiences so that homework matters.
• Develop approaches and strategies geared to diverse talents and ways of learning, while maintaining high standards of accountability.

Reduce opportunities to engage in academic dishonesty and challenge its occurrence.
Purpose: The purpose of this assignment is to familiarize students with experimental methodology and critical thinking. Students will learn to write in a scientific format where all statements must be validated by fact. Writing style, grammar, and sentence structure will be an important component of this assignment.

Method: A hypothesis will be provided to the class for discussion. From this hypothesis, students will develop an experimental design to test the hypothesis in the absence of environmental or genetic variables that may alter or bias the data. Over the course of several weeks students will participate in every aspect of the experiment, including: 1) implementation of experimental protocol; 2) collection of research data; 3) summary, analysis and interpretation of research data; 4) development of a scientific paper in journal format.

Research Paper Format:

I. Introduction: Introduce the problem. This is the literature review section where the subject matter is introduced and some general background information is provided. The introduction will require the use of library resources to locate related research papers that discuss similar subject matter. Students will summarize a minimum of four outside studies (preferably journal/peer reviewed) as they relate to the class project. The objective of the study is clearly stated at the end of the introduction.

II. Methods: Explain how the trial was conducted to meet the needs of the objectives. Include dates, feed, housing, breeds, age, sex, experimental design, treatments, anything related to the setup and execution of the study.

III. Results: Report the data in a manner that is easy to understand. Graphs, charts or table formats are required.

IV. Discussion: Discuss the data as it relates to the hypothesis, i.e., do results from this study prove or disprove your hypothesis? Were the methods adequate to test the hypothesis? How does your data compare to the literature described in the introduction?

**Results and discussion may be combined into a single section. If not, the results section should not contain discussion of previously published work (from your library research). Results and references to tables and figures already described in the results section should not be repeated in the discussion section.**

V. References: Cite your references in the format used in the Journal of Animal Science

VI. Learner Outcomes: Describe in some detail what you have learned from this exercise, i.e. were you aware of the precision required for scientific discovery or did you learn to look more critically at information reported as “new scientific findings”? 
**Final Paper Grading will be as follows:**

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<thead>
<tr>
<th>Points:</th>
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<tbody>
<tr>
<td>1. Presentation: Organization/neatness/professionalism</td>
<td>20</td>
</tr>
<tr>
<td>2. Introduction:</td>
<td>20</td>
</tr>
<tr>
<td>3. Materials and Methods:</td>
<td>20</td>
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<td>4. Results &amp; Discussion</td>
<td>20</td>
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<tr>
<td>5. Literature cited: At least 4 solid references in correct format.</td>
<td>15</td>
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<td>6. Learner Outcomes: What did you learn from this exercise?</td>
<td>5</td>
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<td><strong>Total:</strong></td>
<td><strong>100 pts.</strong></td>
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**Schedule of research project (tentative):**

1. Project begins: Beginning of September
2. Literature research lab: collect scientific articles in lab week of 10/6
3. Rough drafts of sections due: TBA
4. Data collection complete: in lab beginning of November
5. Final paper due: Thursday 12/3 in lecture.

**What you should take from this exercise:**

1. An appreciation for scientific research. As a class, we conduct a very simple study that quickly becomes complicated by outside variables which need to be controlled, mitigated or evenly distributed among all subjects.
2. Learn scientific method and terms/definitions
3. Learn how to use library databases
4. Discover the body of knowledge available in the peer reviewed literature.
5. Learn the difference between good research and bad research
6. Critically evaluate statements made in print – are they justified in making specific statements.
7. Synthesize information from multiple sources and discuss their similarities or differences as it relates to our hypothesis.
Lecture and Assigned Reading Schedule

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<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
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<tr>
<td></td>
<td></td>
<td>a. <strong>LAB:</strong> Introduction to the various livestock species at the University Farm: Lab safety procedures. Students will become familiar with terminology and tour production units on the University Farm to achieve an overall perspective of facilities and animal production practices. Lab at university farm.</td>
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<tr>
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<td>a. <strong>LAB:</strong> Animal Products: Students will become familiar with products that are produced by animals for human use. Students will also become familiar with measures to ensure product safety including HACCP. Lab will be held at the university farm meats lab.</td>
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<tr>
<td>3</td>
<td>9/7-9/9</td>
<td>Monday – Labor Day Holiday. Basic Cell Physiology: WebCT for reading assignment. Basic features of cell structure and function. Differences between prokaryotic and eukaryotic cells. Structural comparisons between mammalian and plant cells. <strong>Quiz 1:</strong> COVERS WEEKS 1&amp; 2 and will be given in LECTURE Wed. 9/9</td>
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<tr>
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<td>a. <strong>LAB:</strong> There will not be any labs held this week.</td>
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<td>4</td>
<td>9/14-9/16</td>
<td><strong>Fundamentals Principles of Genetics:</strong> Chapter 8 pages 147-156: Chromosomes, cell division, mitosis and meiosis. DNA structure and function.</td>
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<td>a. <strong>LAB:</strong> Cell Components/Hematology: Students will use this laboratory to reinforce theory of the cell cycle. Cells will be collected from the blood sampling of sheep. Blood samples will be analyzed for white blood cell count, packed cell volume and for total protein. Lab at university farm.</td>
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<tr>
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<td>a. <strong>LAB:</strong> Biotechnology/DNA Extraction Students will become familiar with the use of DNA technology in animal agriculture. DNA will be extracted from thymus cells and quantified. Lab will be help on campus in Plumas hall. Room TBA. <strong>Quiz 2:</strong> COVERS WEEKS 3 &amp; 4</td>
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<tr>
<td>6</td>
<td>9/28-9/30</td>
<td><strong>Biotechnology and Genetic Engineering:</strong> Chapter 10 pages 208 – 226 Biotechnology, genetic engineering, transgenesis and recombinant DNA technology. Applications to agriculture.</td>
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a. **LAB: Biotechnology/DNA Fingerprinting**  Students will use restriction enzymes to fingerprint DNA. DNA will be separated by gel electrophoresis and stained for analysis.  **Lab will be help on campus in Plumas hall. Room TBA.**

7 10/5-10/7  **Animal Nutrition** The six major classes of nutrients will be covered (water, carbohydrate, fat, protein, vitamins, minerals) and how they are important to animals. Discuss the importance of a balanced diet. Different digestive tracts of species covered.

a. **LAB: Library/Search/Paper Writing Laboratory:** Students learn to search library databases for scientific information. Further discuss paper expectations. Demonstrate the use of Excel for data analysis. Make preliminary paper assignment.  **Lab will be help on campus in Tehama 131. Lab will start on the hour. (Not 15 min. after)**

8 10/12-10/14  **Principles of Selecting and Mating Domestic Animals:** Chapter 9 pages 159-181. Hitting the highlights of animal breeding. Selection of superior breeding stock. Predicting the amount of progress possible through selection. Mating systems for livestock improvement.  **Quiz 3: COVERS WEEKS 5, 6, & 7**

a. **LAB: There will not be any labs held this week.**


a. **LAB: Reproductive physiology of the male:** Testicular dissections, breeding soundness examinations and semen evaluation.


a. **LAB: Reproductive physiology of the female:** Students will compare reproductive tracts from several species and participate in the process of artificial insemination of a domestic species. Pregnancy evaluation will also be conducted using ultrasound technology.  **Quiz 4: COVERS WEEK 8 & 9**

11 11/2-11/4  **Anatomy and Physiology of Domestic Animals:** Reading assignment on WebCT. The circulatory system. The respiratory system. The urinary system.

a. **LAB: Growth Laboratory:** Students will evaluate chick embryos for prenatal growth and development. To study postnatal growth, students will use their growth project.

12 11/9-11/11  **Anatomy and Physiology of Domestic Animals:** Reading assignment on WebCT. The digestive system. The muscular-skeletal system.  **Quiz 5 in Thursday Lecture: COVERS WEEKS 10 & 11**

a. **LAB: Animal Selection:** Students will apply information regarding phenotypic and genotypic selection to groups of domesticated livestock selected for specific production traits: Weigh and collect data on experimental animals.

13 11/16-11/18  **Ethology and Animal Behavior:** Chapter 13 pages 251-272. Areas of study in animal behavior. Communication, aggression, social structure, sexual behavior, maternal behavior, etc. Students will learn the difference between innate and learned behavior. Livestock behavior as it relates to handling and animal welfare.
a. **LAB: Anatomy & Physiology:** Students will evaluate circulatory and respiratory tissue of various livestock species. Heart and lung tissue will be examined.

14 11/23-11/25  **THANKSGIVING BREAK.**

15 11/30-12/2  **Animal Disease and the Health of Humans: Chapter 14 pages 275-284.** Disease and health, types of diseases and pathology. The resistance of animals and people to pathogens.

   a. **LAB: Animal health:** Discussion will focus on disease, disease organisms, symptoms, transmission and treatment. Students will learn the process of temperature, pulse and respiration (TPR). Students will perform basic bacteriology techniques on raw and pasteurized milk samples. In addition, students will perform an antibiotic sensitivity test. **Quiz 6: COVERS WEEKS 12 & 13**

16 12/7-12/9  **Animal Disease and the Health of Humans: Chapter 14 pages 284-294.** Basic diseases and zoonotic type organisms. Governmental safeguards for animal and human health, protecting a nation.

   a. **LAB: Health and Disease 2 and semester recap:** Bacteriology plates from last week will be read and interpreted. Semester recap and evaluation.

17 12/14 - Monday at 10:00 – 11:50 am  **Final – Quiz 7: COVERS WEEKS 15 & 16**
Where is the FARM 003 classroom at the University Farm?

- Once you get to the University Farm’s main entrance, go south on the main road and turn right on the first paved road to the west (by the Dairy Unit). If you drove over the speed bumps, you missed the road…

- Drive past the large yellow pavilion (which you will see on the left) and turn left at the first paved road.

- The FARM classrooms are next to the yellow pavilion, turn in and park in the large gravel parking lot. Find our classroom, FARM 003.

- There are several restrooms adjacent to our classroom and the pavilion.

- Speaking of parking, try to carpool if you can to save on fuel. Many of you will need your own vehicle to get back to campus for classes but do what you can to carpool. It’s a great way to meet your classmates and develop study groups.

- Play close attention to the weather forecast: we will be working outside so it will either be really hot (fall semester) or really wet and cold (spring semester). Wear appropriate attire, what I call “grubbies”, clothes you don’t mind getting wet, dirty or muddy. Bring sunscreen or a raincoat, whichever is more appropriate for your semester.

- Bring drinking water since there is not a drinking fountain nearby and consider bringing your lunch or a snack. There is no food or drink allowed in the FARM classrooms but you are welcome to eat outside in the parking area.

Labs start at :15 past the hour so don’t get a speeding ticket trying to get to the University Farm. Watch out for trains. DO NOT try to beat the train or drive around the railroad arms, your life is too precious to risk it. Besides, the CA Highway Patrol and Butte County Sheriff patrol these back roads a lot so watch out because they’re watching for you.

Remember the University Farm is a working farm with slow-moving heavy equipment, livestock, and many other lab activities so be alert, watch your speed, and drive safely at all times.