

Bovine Reproduction Management

ANEQ 510

Fall 2017

Instructors:

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Office hours: by appointment – Please contact me by email including “ANEQ 510 Issue” in the subject

Prerequisite: ANEQ 310 or equivalent

Instructor’s Responsibilities:

Our goal is to do the best job possible teaching this course. Our teaching philosophy is to challenge students to be proactive. With each academic success comes additional confidence to successfully face a greater challenge in the future. We also believe that students will remember information they discover for themselves much longer than information they

simply hear during a lecture. Therefore, the laboratory sessions have been designed to provide students with as much hands-on experience as possible.

Developing the ability to be a self-directed learner and to critically analyze information are important aspects of intellectual development. We remember information that is relevant to us and is presented in a meaningful context (i.e., connected to other information we have learned). In addition to long-term retention of information, we expect you to critically analyze information, solve problems, present a logical argument, communicate effectively, and work as a productive member of a team. Consequently, we have developed a series of reproductive management problems and experiences to aid your development in these areas.

Student's responsibilities:

We expect you to come to each lecture and laboratory session with a desire to learn. You are expected to read the assigned articles and complete each assignment. You are also expected to study the material thoroughly outside of class and come to class prepared to ask questions about subjects that are unclear to you. We also expect you to make efficient use of each laboratory session. Remember, learning is an active process and requires a significant amount of time and effort!

We expect students to question instructors on things that are not presented clearly, or if there is other pertinent information that students feel is important to the topics. Please be inquisitive, but not obnoxious.

There are very few ways to recreate the learning experience than to be present in lecture and laboratories. Therefore, we encourage regular student attendance in both lectures and labs.

Course Objectives:

- a. Enable students to learn the fundamental principles of cattle reproductive management.
- b. Familiarize students with procedures and techniques used for improving reproductive efficiency in cattle, with some application to other livestock. Physiological mechanisms regulating important reproductive events will be presented.
- c. Enable students to integrate reproductive techniques in solving management problems.
- d. Provide hands-on experience in learning reproductive management techniques and tools.

Textbooks:

The reading assignments and lectures will be available on Canvas.

There is no required textbook for this class. The following are recommended resources:

- Pathways to Pregnancy and Parturition, by P.L. Senger. Third Revised Edition.
- Applied Animal Reproduction, by H.J. Bearden, J.W. Fuquay, and S.T. Willard, 2004, Pearson Prentice-Hall, Inc., 6th Edition, ISBN 0-13-1128310.
- Bovine Reproduction, Edited by R. M. Hopper. 2015.

Examination, Quizzes and Grading System:

A. Final grade will depend upon performance on the following methods of evaluation:

Item	% of Grade
Reading / Presenting Journal articles / Heifer genotyping project	20
Weekly quizzes	20
Midterm examination (includes lab material)	30
Final examination (includes lab material)	30

B. Grading System:

The final grade will be determined by the percentage of total possible points earned. Grades will consist of whole letter grades, not plus and minus. *The instructors reserve the right to adjust grading to a curve scale based upon performance of the class.*

- 90% & above - A
- 80% to 89% - B
- 70% to 79% - C
- 60% to 69% - D
- Below 60% - F

Lecture Topics (subject to change):

See schedule

Laboratory Topics and Dates (subject to change):

See schedule

Journal Discussion:

Every Wednesday class (starting on Sept 13) we will have a journal discussion session where three papers will be briefly presented by 3 students (10 minutes/student-paper). The whole class will have the materials reviewed and a short quiz will be taken after the presentations.

Volunteers will be assigned to each paper before the journal discussion and the papers will be posted in CANVAS.

You will be evaluated on the following points:

Introduction: (15 Points)

- Give a brief introduction of the topic
- What is the background
- Why is this important for us/for the industry?

Body of talk: (15 Points)

- Describe the methods, precise and short
- Describe the main results
- What is the “take home message”?

Delivery: (20 Points)

- Within time limit (10 minutes)
- Clearly spoken
- Eye-contact with the audience; talk to the audience (not the wall or the screen)
- Body language appropriate

Dairy heifer genotyping:

Genomic testing is a new tool that livestock producers are using to improve management, selection and breeding decisions on the farm/ranch. A group of young dairy heifers will be sampled and DNA will be submitted for genotyping. A group of students will work on results interpretation and management discussion.

Additional items to consider and discuss:

1. AI Certification (optional), additional time arranged when needed

Certification Requirements

1. Be proficient in threading the AI instrument through the cervix of the cow (2 cows in 15 minutes, minimum)
2. Demonstrate proper thawing and handling of frozen semen; including loading AI instrument.

**ANEQ 510 Schedule and Discussion Topics
Tentative - Fall 2017**

Day	Date	Topic	Instructor
August			
M	8/21	Intro and Overview	Pinedo
W	8/23	Oogenesis	Bruemmer
F	8/25	Folliculogenesis, Ovulation	Bruemmer
M	8/28	Luteogenesis, Luteolysis	Pinedo
W	8/30	Endocrine Cycle	Pinedo
September			
F	9/1	Spermatogenesis / Male endocrinology	Pinedo
M	9/4	Labor Day	-
W	9/6	Reproductive concepts in dairy	Pinedo
F	9/8	Principles of BSE	Callan
M	9/11	Calving	Pinedo
W	9/13	Journal Discussion	Pinedo
F	9/15	Postpartum Physiology	Pinedo
M	9/18	Sexed Semen	Seidel
W	9/20	Journal Discussion	Pinedo
F	9/22	Introduction – Assisted Reproductive Technologies	Bruemmer
M	9/25	Managing reproduction at the farm	Velez
W	9/27	Journal Discussion	Pinedo
F	9/29	Beef Quality Assurance Program	Bigler
October			
M	10/2	AI Procedures	Princ
W	10/4	AI Protocol Implementation	Princ
F	10/6	MIDTERM EXAM	Pinedo
M	10/9	Embryo Transfer	Barfield
W	10/11	In Vitro Fertilization	Barfield
F	10/13	Embryo manipulation / cryopreservation	Barfield
M	10/16	Pregnancy and maternal recognition	Hansen
W	10/18	A.I. Training	Pinedo
F	10/20	Journal Discussion	Pinedo
M	10/23	Embryology / Fetal development	Bouma
W	10/25	Placentation	Bouma
F	10/27	Genomics – Selection for non-traditional traits	Pinedo

M	10/30	Disease Case Studies	Callan
November			
W	11/1	Journal Discussion	Pinedo
F	11/3	Reproductive Diseases	Roman-Muniz
M	11/6	Fertility management	Olson
W	11/8	Journal Discussion	Pinedo
F	11/10	Genetics – Fertility	Enns
M	11/13	Deseret Ranch	Meek
W	11/15	Calf Genotyping: On farm application	TBD
F	11/17	Crispr/Cas9 Genome editing	Martin
M	11/20	Holiday	-
W	11/22	Holiday	-
F	11/24	Holiday	-
M	11/27	Beef heifer and cow repro management	Ahola
W	11/29	Journal Discussion	Pinedo
December			
F	12/1	Journal Discussion	Pinedo
M	12/4	Nutrition / Fertility	Archibeque
W	12/6	Journal Discussion	Pinedo
F	12/8	Nutrition and Health	Elliot
M	12/12	Final Exam (7:30 AM – 9:00 AM)	Pinedo

Locations:

Lectures on Monday – Wednesday – Friday:

11:00 – 11: 50 AM, Glover Bldg. room 201

Lab on Wednesday:

8:00 – 9:40 AM session, ANS Bldg. room 131 / Lab 242

2:00 – 3:40 PM session, ANS Bldg. room 33 / Lab 242

Other possible locations to be announced.

ANEQ 510 – Bovine Reproduction Management– Lab Details

Fall Semester, 2017

1. **Lab coordinator:** Dr. Pablo Pinedo, DVM, PhD pablo.pinedo@colostate.edu
Office: 042 (basement)
Email is the best way to contact me – please include ANEQ 510 in subject
2. **Teaching support:**
Dave Shaffer (ARDEC livestock coordinator) David.Schafer@colostate.edu
ARBL/VTH faculty – Bruemmer, Barfield, Seidel, Van Metre, etc.
3. **Office hours:** By appointment.
4. **Time/place:** Lab: 8:00 to 9:40 am 131 Animal Sciences
2:00 to 3:40 pm 33 Animal Sciences
5. **Laboratory topics:** PROPOSED DATES SUBJECT TO CHANGES

Day	Date	Lab Session Topic	Instructor	Location
W	8/23	No Lab	-	-
W	8/30	Reproductive anatomy: Male/female	Pinedo	AS 242*
W	9/6	Pregnant reproductive tracts and fetuses	Pinedo	AS 242*
W	9/13	Breeding Soundness Exam (BSE) in bulls	Callan, Pinedo	ARDEC
W	9/20	Objective evaluation of sperm (CASA)	Graham	Room 33 - 131
W	9/27	Introduction to AI (tracts, model)	Princ / Pinedo	AS 242*
W	10/4	La Luna Dairy Sample collection for genotyping	Bigler / Pinedo	ARDEC
W	10/11	Beef Quality Assurance (BQA) practices	Pinedo	La Luna Dairy
M	10/16	AI practice (8:00-10:30 am and 1:30-4:00 pm)	Pinedo	ARDEC
T	10/17	AI practice (8:00-10:30 am and 1:30-4:00 pm)	Pinedo	ARDEC
W	10/18	AI practice (8:00-10:30 am) Test (1:30-4:00 pm)	Pinedo	ARDEC
W	10/25	In vitro fertilization	Barfield	ARBL Foothill campus
W	11/1	Embryo Transfer	Barfield	ARBL Foothill campus
W	11/8	Calving and assisting with dystocia	Pinedo, Van Metre	VTH
W	11/15	Heifer Genotyping Presentation	Pinedo	Room 33 - 131
W	11/22	Journal Discussion	Pinedo	Room 33 - 131
W	11/29	Journal Discussion	Pinedo	Room 33 - 131
W	12/6	Journal Discussion	Pinedo	Room 33 - 131

*On these days, lab will begin in the classroom (rooms 33 or 131)

6. **Transportation:** Due to logistical constraints and the graduate-level of this course, transportation to labs will be the responsibility of students. Carpooling is encouraged. Lab periods will last the entire period (8:00-9:40 am, 2:00-3:40 pm) to maximize time spent in the labs.
7. **Clothing:** Dress properly for each laboratory period, which will include hands-on anatomy labs and AI/palpation practice at ARDEC. Weather conditions may be extreme (cold, wet, snowy, muddy, etc.), and students should plan accordingly. Cover-all and boots that can be washed (i.e. rubber boots) would be ideal.
8. **IMPORTANT: Health considerations:** Please let the instructor know about **any health condition** or special need that may require distinctive treatment or caution regarding lab activities. If you are (or suspect to be) **pregnant** discuss with your physician before participating in any lab session.

Academic Integrity:

CSU policy on academic integrity, found in the Student Rights and Responsibilities section of the University General Catalog (<http://www.catalog.colostate.edu>), applies to this course. All incidents of academic misconduct (e.g., cheating, plagiarism, unauthorized possession or distribution of academic materials, falsification, facilitation of cases of academic misconduct, etc.) may result in a failing grade on the relevant assignment, exam or for the course. Furthermore, all incidents of academic misconduct will be reported to the Office of Conflict Resolution and Student Conduct Services. Students sign assignments and tests to declare that the work was completed independently and without unauthorized aid. This represents student commitment to honorable and trustworthy behavior, in the spirit of the Honor Pledge. The course instructor will list items such as class and study group notes, review assignments, formula sheets, and (or) tests from previous courses, that can be shared without violating academic integrity.

Academic honesty is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person's work has been responsibly and honorably acquired, developed, and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards academic dishonesty as an extremely serious matter, with serious consequences that range from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult the course instructor. Plagiarism from any source for written assignments is not acceptable.

Cell phones turned off when you enter the classroom.