

## ANS6312C – Applied Livestock Reproduction

### Course coordinators:

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Office Hours: T, TR 10:00AM -12:00PM and by Appt.  
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**Prerequisites:** ANSC 3319C

**Course Offered:** Spring

**Total Credits (3)**

**Lectures:** Tuesday 12:50 – 2:45 PM (Periods 6-7)

**Lab:** Thursday 12:50 – 2:45 PM (Periods 6-7)

**Location:** ANS 102

**Location:** Animal Units or ANS 155

### Description:

Applied Livestock Reproduction at the University of Florida is an experiential course designed to provide industry and professional students with unique experiences in applied reproductive management and practices. Enrolled students rotate through numerous animal teaching units to reinforce classroom curriculum in beef, dairy, equine and porcine reproductive practices. Topics include estrus detection, synchronization, management, artificial insemination, ultrasonography, assisted reproductive technologies, semen collection and evaluation, sperm freezing, embryo manipulation and laboratory techniques. Applied concepts will integrate assisted reproductive technologies with basic and translational emphasis on improving livestock reproductive efficiency.

### Objectives:

1. Relate different components of ruminant reproductive management programs and compare the underlying physiological mechanisms regulating these components with emphasis on species differences.
2. Differentiate emerging reproductive technologies and discuss how these technologies can be incorporated into reproductive management programs in dairy, beef, porcine and equine industries.
3. Perform reproductive management techniques including emphasis on rectal palpation, pregnancy diagnosis, artificial insemination, and semen management.
4. Integrate principles of reproductive management with assisted reproductive technologies and genomics.
5. Design and deliver a new class lecture that integrates Objectives 1-4 with a concept that could be applied to this course for future instruction.

Graduate students enrolled in this course will develop a single lecture in coordination with the course instructor that complements an existing course topic by the inclusion of fundamental learning material at the cellular or molecular level. Graduate students will be required to present formal teaching as written and electronic material for a 30 min section to the class complete with learning objectives and expected outcomes. In addition, the topic must include 1) relevance to industry application and 2) identification of research areas to improve the focus topic. Graduate students will gain valuable skills germane to industry and academia including organization, lecture preparation and delivery, dissemination of materials, oral speaking, presentation, accuracy, and accountability. Graduate students will receive peer feedback by written evaluation along with course instructor

evaluation to further improve in the above skill areas. Lectures provided by graduate students will also be recorded and provided for self-evaluation.

**Textbook:** No textbook required. As a reference source and in supplement to classroom materials, consult "Pathways to Pregnancy and Parturition" (3rd Edition 2012, P. L. Senger). A copy of this textbook will be requested for library reserve. Students are responsible for reading and comprehending materials disseminated.

**Grading & Exams:**

Final grade will consist of two lecture exams, teaching unit participation, and a comprehensive final exam. This course is taught concomitant with ANS 4320C, the undergraduate version of this course. Graduate students have different grading requirements than the undergraduate version of this course. Graduate students are expected to develop and deliver one additional lecture to include 1) written and 2) oral presentation.

**All exams and quizzes are closed book and do not permit any additional resources unless stated.**

Actual grades on all exercises will be the sum of the points received for correct responses as a percentage of total points possible. Final course grades will be based on the following percentage grade scale:

	<b>B+</b>	86.7-89.9	<b>C+</b>	76.7-79.9	<b>D+</b>	66.7-69.9	<b>F</b>	< 60
<b>A</b>	≥94.0	<b>B</b>	83.3-86.6	<b>C</b>	73.3-76.6	<b>D</b>	63.3-66.6	
<b>A-</b>	≥90.0 to <93.9	<b>B-</b>	80.0-83.2	<b>C-</b>	70.0-73.2	<b>D-</b>	60.0-63.2	

<i>Final Grade Components</i>	<b>Points</b>	<b>~ % Final Grade</b>
Two lecture exams (105 pts each)	210	35
Lab Participation (14 labs * 10 pts each)	140	23
Final exam (100 pts)	100	17
Independent Lecture (100 pts)	100	17
Mini review – Topic determined with instructor	50	8
<b>Total possible</b>	600	100

Information regarding University Policy on grade point equivalencies and calculation of grade points is located at (<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>).

**Lecture exam dates:**

**Exam 1:** Feb 27<sup>th</sup> (in class)      **Exam 2:** April 11<sup>th</sup> (in class). Lecture exam dates are tentative and can change at the discretion of the instructor.

Final Exam: April 25<sup>th</sup> (Thursday: 12:50-2:45 PM).

Exams will be conducted outside of classroom activities and will consist of a series of written questions or scenarios that will require a written response in paragraph form. For short answer and essay questions, a legible, organized, concise, accurate, and grammatically correct answer will be expected to receive full credit. Outlining answers into pertinent points is acceptable and the suggested method of answering questions provided that the interrelationships between points are indicated. Lecture exams/quizzes will cover all material presented during lecture, supplemental material and laboratory activities.

## **Important Dates:**

[See UF Dates and Deadlines](#)

## **Location for Laboratory Instruction**

ANS – Animal Sciences Building, Room 155

DTU – Dairy Teaching Unit <https://animal.ifas.ufl.edu/facilities/dairy-unit/>

BTU – Beef Teaching Unit (north) <https://animal.ifas.ufl.edu/facilities/beef-teaching-unit/>

HTU – Horse Teaching Unit <https://animal.ifas.ufl.edu/facilities/horse-teaching-unit/>

VTH – Veterinary Teaching Hospital

- Specific meeting locations for the teaching units and VTH will be announced prior to class.

## **Course Information, Scheduling and Resources:**

Please consult the course Canvas Page for weekly announcements, updated information on laboratory activities, modules, reading material and assignments. Handouts when available will be provided under the Modules tab on Canvas and should be used as a resource in preparation for lecture and as studying material for exams. Reading material will also be posted for undergraduate and graduate students in this course. At the end of the syllabus are some suggested reading materials for this course that will supplement graduate student activities. Required reading material will be posted on the Canvas website under the Modules tab.

## Instruction Schedule

The schedule below is tentative regarding the dates and topics to be covered; this schedule can change at the instructor's discretion and upon resources and lecture availability.

Week	Date	Topic	Location		Instructor
1	01/14 – 1/16	Tues – Biosecurity & Cattle Handling	T – N/A	TR - BTU	Daigneault/Callaham
2	01/21 – 01/23	Estrus synch, detection, palpation	T – ANS	TR - BTU	Bisinotto/Callaham
3	01/28 – 01/30	Estrus synch, Timed AI, palpation	T – ANS	TR - BTU	Bisinotto/Daigneault
4	02/04 – 02/06	AI Perspectives and AI Demo	T – ANS	TR - BTU	Daigneault/Umphrey
5	02/11 – 02/13	Beef Management & Heat Detection	T – ANS	TR - BTU	Binelli/Callaham
6	02/18 – 02/20	Principles of Ultrasonography	T – ANS	TR - DTU	Daigneault/Callaham
7	02/25 – 02/27	Equine ART & Demo	T – ANS	TR - HTU	Daigneault/Callaham
8	03/04 – 03/06	<b>Exam 1</b> – Dairy Management	T – ANS	TR - ANS	Daigneault/Toledo
9	03/11 – 03/13	Bull Breeding Soundness Exam	T – ANS	TR - BTU	TBD
10	03/18 – 03/20	<i>Spring Break</i>			
11	03/25 – 03/27	Small Ruminants	T – ANS	TR – ANS	Anton/Diehl
12	04/01– 04/03	Porcine & Preg Check	T – ANS	TR – ANS	Daigneault
13	04/08 – 04/10	History of Cryop and Sperm Freeze	T – ANS	TR – ANS	Daigneault/Callaham
14	04/15 – 04/17	Embryo Vitrification - <b>Exam 2</b>	T – ANS	TR – ANS	Daigneault
15	04/22 – 04/18	Poultry – Embryo Transfer	T – ANS	TR – BTU	Daigneault/Spell
16	04/22 – 04/25	<b>Graduate Lectures – Reading Day</b>	T – ANS	TR – ANS	Daigneault/Callaham
17	04/28 –(Mon)	<b>Final Exam 3:00 -5:00 PM</b>	T – ANS		

## Activities

The primary objectives of teaching activities are to provide hands-on activities with live animals. Throughout the semester, you will work with live cattle, pigs, horses, and other domesticated livestock species. Proper clothing including close-toed shoes or boots is required.

## **Lab Policies**

There will be no opportunities to make-up missed teaching activities at the animal units. Any missed activity without prior approval from the instructor or for reasons other than those listed below will not be excused and a grade of "0" will be recorded for that activity. All requests to be excused from a lab must be submitted to Dr. Daigneault or Mr. Callaham in writing by email. This policy will be strictly enforced.

In general, acceptable reasons for absence from or failure to participate in class include illness, serious family emergencies, special curricular requirements (e.g., judging trips, field trips, professional conferences), military obligation, severe weather conditions, religious holidays, and participation in official university activities such as music performances, athletic competition or debate. Absences from class for court-imposed legal obligations (e.g., jury duty or subpoena) must be excused. Other reasons also may be approved.

If a student is absent from classes or examinations because of illness, they should contact their instructors. Students should contact their college by the deadline to drop a course for medical reasons. Students can petition the Dean of Students Office to drop a course for medical reasons. The university's policy regarding medical excuse from classes is maintained by the Student Health Care Center.

## **Biosafety and Biosecurity**

The biosafety and biosecurity of animals and students is a top priority for laboratory activities. Disease transmission can have negative consequences on animal and human health that can also be fiscally taxing. To prevent disease transmission, you may not participate in a lab conducted at one of the UF animal facilities if you have been on a different commercial farm with the previous 48 hrs. Please contact Dr. Daigneault if you have specific concerns. Some laboratory activities may require you to bring clean rubber boots that must be washed and disinfected prior to laboratory activities. You must also complete the biosecurity exercise prior to participation in labs conducted at animal units. The use of cell phones or cameras at animal facilities is not permitted without receiving written permission. Instructors and TA's may dismiss students from a lab for violation of biosecurity procedures.

## **Locations**

Laboratories will be held at several locations including the Beef Teaching Unit (north) Dairy Unit, Swine Teaching Unit, Horse Teaching Unit and ANS 155. Please refer to the lab schedule to determine where lab will be each week. A map and directions can be found at the end of this syllabus and the course web page. Transportation is generally not provided but may be available for DTU travel.

## **ADDITIONAL COURSE INFORMATION**

### **Class Demeanor**

Students and attendees in the classroom are expected to act in a professional, polite, and respectful manner. Any person engaging in disruptive behavior will be asked to leave the room. Cell phones should remain in silent mode throughout the class. The use of cell phones is disruptive to others sitting within viewing vicinity, considered disruptive and therefore is not permitted. Personal devices may be used to engage in lecture, but viewing of any other content is considered disruptive to the learning environment. If content that does not strictly pertain to lecture material is displayed on a device, the person in possession of the device will be asked to remove the content or turn off the device.

## **Academic Honesty**

Academic Honesty As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <https://policy.ufl.edu/regulation/4-040/>

## **Services for Students with Disabilities**

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation 0001 Reid Hall, 352-392-8565, <https://disability.ufl.edu/>

## **Software Use and Privacy Policies**

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

## **Campus Helping Resources:**

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students experiencing difficulties or lacking clear career or academic goals, which interfere with their academic performance:

University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, [www.counseling.ufl.edu](http://www.counseling.ufl.edu)

- Counseling Services
- Groups and Workshops
- Outreach and Consultation
- Self-Help Library
- Wellness Coaching

*U Matter, We Care:* If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.

*Career Connections Center*, First Floor JWRU, 392-1601, <https://career.ufl.edu/>. • Student Success Initiative, <http://studentsuccess.ufl.edu>. Student Complaints: • Residential Course: <https://sccr.dso.ufl.edu/policies/student-honor-code-studentconduct-code/>. • Online Course: <http://www.distance.ufl.edu/student-complaint-process>

*Counseling and Wellness Center:* [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.

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*Student Health Care Center:* Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).

*University Police Department:* [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).

*UF Health Shands Emergency Room / Trauma Center:* For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road,

Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).

### Academic Resources

*E-learning technical support:* Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).

*Career Connections Center:* Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

*Library Support:* Various ways to receive assistance with respect to using the libraries or finding resources.

*Teaching Center:* Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

*Writing Studio:* 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

*Student Complaints On-Campus:* [Visit the Student Honor Code and Student Conduct Code webpage for more information](#).

*On-Line Students Complaints:* [View the Distance Learning Student Complaint Process](#).

### **Online Course Evaluation Process**

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can

complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at: <https://gatorevals.aa.ufl.edu/public-results/>.

## **Attendance**

Requirements for class attendance and make-up exams, assignments and other work are consistent with University policies located at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

## **Make-up work:**

A student missing an exam will be allowed to make up the exam provided that a documented, valid reason for missing it exists (Please see valid excuses in lab section). Whenever possible, these problems should be discussed with the instructor in advance, preferably by email, excuse note, or handwritten note. A missed exam with no valid excuse will be considered as a “0”.

## **Course Expectations**

Lecture and lab attendance are highly correlated with your final grade, so it is expected that you attend both on a regular basis. Class and lab are “No Cell Phone Areas”. Class and lab decorum require that you act socially, professional, treat fellow students with respect, and appreciate their viewpoints and beliefs.

## **Reading Material**

Improvements in Gene Editing Technology Boost Its Applications in Livestock. Iuri Viotti Perisse<sup>1</sup>, Zhiqiang Fan<sup>1</sup>, Galina N. Singina<sup>2</sup>, Kenneth L. White<sup>1</sup> and Irina A. Polejaeva<sup>1</sup>. *Frontiers in Genetics*, 2019.

Review on Sperm Sorting Technologies and Sperm Properties toward New Separation Methods via the Interface of Biochemistry and Material Science. Katigbak, Robert D, Turchini Giovanni M, de Graaf Simon P, Kong L, Dumeénil Ludovic. *Advanced Biosystems*. 2019

Reproductive biology in the “omics” era: what can be done? F.L. D’Alexandri, S. Scolari, C.R. Ferreira. *Anim Reprod*, vol.7, n3, p.177-177, 2010

Factors affecting calf birth weight: A review. M.D. Holland and K.G. Odde. *Theriogenology* 38:769-798,1992

Genetic effects on beef heifer puberty and subsequent reproduction L. C. Martin, J. S. Brinks, R. M. Bourdon and L. V. Cundiff. *J Anim Sci* 1992. 70:4006-4017.

Management considerations in heifer development and puberty. D. J. Patterson, R. C. Perry, G. H. Kiracofe, R. A. Bellows, R. B. Staigmiller and L. R. Corah. *J Anim Sci* 1992. 70:4018-4035.

Effect of Body Condition on Rebreeding. William E. Kunkle and Robert S. Sand. EDIS AS 51. University of Florida IFAS Extension.

Effects of Body Condition on Productivity in Beef Cattle. William E. Kunkle, Robert S. Sand, and D. Owen Rae. EDIS SP-144. University of Florida IFAS Extension.

Sexing mammalian sperm for production of offspring: the state-of-the-art. L.A. Johnson. *Animal Reproduction Science* 60–61 \_2000. 93–107.



Economics of selecting for sex: the most important genetic trait. G. E. Seidel, *Theriogenology* 59 (2003) 585-598.

Estimation of genetic parameters for scrotal circumference, age at puberty in heifers and hip height in Brahman cattle. C. A. Vargas, M. A. Elzo, C. C. Chase, Jr, P. J. Chenoweth and T. A. Olson. *J Anim Sci* 1998. 76:2536-2541.

Genetic relationships between scrotal circumference and female reproductive traits. G. Martínez-Velázquez, K. E. Gregory, G. L. Bennett and L. D. Van Vleck. *J Anim Sci* 2003. 81:395-401.

The value of reproductive tract scoring as a predictor of fertility and production outcomes in beef heifers. D. E. Holm, P. N. Thompson and P. C. Irons. *J ANIM SCI* 2009, 87:1934-1940.

Breeding heifers at one year of age. Biological and economic considerations. Short, R. E., R. B. Staigmiller, R. A. Bellows, and R. C. Greer. 1990.. In:Proc. 39th Annu. Beef Cattle Short Course. pp. 93-106. Univ. of Florida, Gainesville

Carcass composition in mature hereford cows: estimation and effect on daily metabolizable energy requirement during winter . Wagner, J. J., K.S. Lusby, J. W. Oltjen, J. Rakestraw, R. P. Wettemann, and L. E. Walters. 1988.. *J Anim Sci.* 66:603-612.