

Sustainable Livestock Production Systems
Course Syllabus
Fall 2020

Course listing: AVS 4500/4501

Date/Time: Tuesday and Thursday, 12:30 pm to 13:45 pm and Tuesday 14:00 pm to 15:50 pm (Lab)

Location: Lecture in Business Building 225 (Hybrid Blended-Starting September 21st)
Lab in Poole Agricultural Center 174 (Hybrid Blended-Starting September 21st)

Instructor: Matias Aguerre, Ph.D., 120 Poole Agricultural Center (maguerr@clermson.edu)
Office hours: By appointment only

Course Learning Objectives:

Students who actively participate in this class will develop the skills to **critically evaluate** livestock production systems as they relate to sustainability and climate change using recent findings from biological, physical, and social sciences.

Students will learn to **interpret** and **analyze** knowledge from crop science, livestock science, environmental science, and social science about distinct livestock production systems, including:

- The complexity and relative sustainability of livestock systems;
- Contribution to climate change: greenhouse gas emissions (CO₂, CH₄, N₂O);
- Environmental impact of excess nutrient excretion (P and N mainly);
- Mitigation of climate change and excess nutrient excretion: carbon sequestration and emissions reduction;
- Adaptation to climate change: adapting management of production systems to changing weather patterns;
- Students will develop **team working** skills;
- Students will improve their research and writing skills in drafting academically rigorous literature reviews.
- Students will learn to **assess** the broader impacts of research beyond the academic setting;
- Students will develop their ability to **communicate** and **explain** information to multiple audiences through multiple media, including:
 - Preparation and presentation of a topic;
 - Journal club style presentation/discussion;
 - Written and audio-visual presentation of your findings in a case study article.
- This course also integrates targeted student learning outcomes related to critical thinking to increase and enhance students **critical thinking** skills. **Critical Thinking** is the process of reflective judgment, which manifests itself in reasoned consideration of evidence, context, methods, standards, and conceptualizations for the purpose of deciding what to believe or what to do (The Delphi Report: Executive Summary: (1990), ERIC Doc ED315 423). This course is being offered as a Clemson Thinks2 (CT2) seminar course. The CT2 initiative at Clemson is part of the university's strategic plan; its objective is to create engaged learning environments that promote critical thinking skills among students;

- Recognizing that scientific knowledge could change over time, particularly with the use of new technologies, students should acknowledge the critical thinking process in scientific work and how it could lead to the right or wrong conclusions if not carefully assessed. Thus, they learn to always consciously go back to their work and **self-consciously monitor their cognitive activities.**

Teaching Methods:

The teaching methods used in this class will be a combination of lectures from the instructor and/or guest speakers and ACTIVE participation of students before, during and after class. Learning activities will include: Before class reading assignments followed by small group in- class discussion of an assigned article, quizzes, worksheets, and a group (2-3 students) writing and oral assignment (term paper with oral presentation).

Roles of Students and Instructor:

Your role as a student: As a student, you are expected to take an **active** role in developing a basic understanding of forage production for livestock. Think of the reading assignments, the class discussions, quizzes and the class project (term paper) as ways to gain new knowledge and to gain skills in critical evaluation of the sustainability of livestock systems. The ways you can be “proactive” in this class include:

- **Be prepared for class and teamwork:** To maximize the benefits from our discussions, it is important that you complete the reading assignments and other homework BEFORE class (**when applicable**). Allocate enough time to read the assigned material carefully. Think of the reading as a way of helping yourself find out what you know and what you don't know or don't fully understand. For making sense of the course material, you have to continually question yourself, your teammates, your classmates and your instructor.
- **Be an active participant in class:** Active participation in class means listening, thinking, taking notes and asking questions. There are (almost) no “stupid questions” in this class. As long as you have a genuine interest in learning the subject matter, all questions will be valid questions! Be honest with yourself and you'll find out what your current level of knowledge really is, and what your misunderstandings might be.

Although it may vary, here is what you are typically expected to do for this class:

Before class:

- Read the assigned material (papers or articles) posted on Canvas complete the reading assignments and other homework BEFORE class (when applicable).

During class: Bring a print out of the article (or other assigned material) or your laptop to access the reading material in class and when applicable the reading assignment/homework. We may engage in any of the following class activities:

- Introduction of the topic with a lecture from instructor or invited speakers;
- Short quiz at the beginning of class with simple questions about the previous lectures and assign readings (including the assignments ready for the day of the quiz),
- Group discussion of assignments/homework;
- Work in groups (teams of 3-4 students) to summarize and discuss the assigned article;
- Discuss a case study (mainly during the laboratory class);
- Field trips to different livestock operations to see how they operate differently **(tentative)**.

After class, you are expected to:

- Review the material in a way that make sense to you;
- If necessary, make an appointment with the class instructor for help.

My role as an instructor: As your instructor, my goal is to help you learn (and as a result help you get good grades). The variety of instruction strategies used for the course will help you acquire knowledge THAT MAKES SENSE TO YOU. I am happy to accommodate for the variety of interests that each student brings to class, but to do so, I need to hear from you! Don't be afraid to set a time to visit with me if you have any concerns. In other words, I want this course to be of interest to each one of you. I hope this class will motivate you to expand your interest in forage management. My role is:

- To define the course topics and relative importance of various subject matters,
- To provide you with the information and resources you need to learn,
- To communicate with you in a way that facilitates your learning,
- To set the level of expectation and evaluate your progress and your work.

Required material:

No textbook is required for this course. Materials including supplemental reading, reference text books, handouts and spreadsheets will be posted on Canvas. Every effort will be made to place the course material on the course management system in a timely manner.

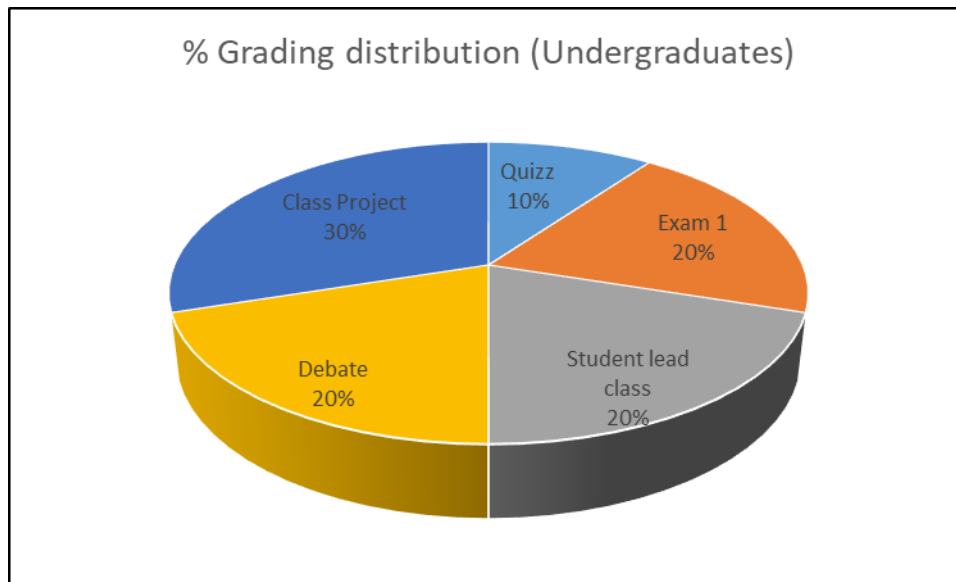
Grading: Below is the list of items that will be part of your final grade:

1. **Class Participation:** Pre-class quizzes (on-line) and/or reading assignments **(50 pts)**.
2. **Mid-term exam (on-line):** October 8th: A non-cumulative 1-hr in-class exams that will include multiple choice questions drawn from lecture presentations, discussion sheets, class discussions and other class-related activities. **(100 pts)**.

3. **In class debate:** The debate format will provide students the opportunity to work in a collaborative and cooperative group setting. By discussing and organizing your points of view for one side of an argument, you will be able to discover new information and put knowledge into action. In addition, you will learn through friendly competition, examine controversial topics and “strengthen skills in the areas of leadership, interpersonal influence, teambuilding, group problem solving, and oral presentation” Further instructions, resource materials and topics can be found in the Team debate description document (I will upload it to Canvas before September 3rd). **(100 pts)**.
4. Prepare and make an in-class student led team presentation and discussion of a mitigation strategy to reduce the environmental impact of livestock operations **(100 pts)**.
5. **Case Study Project-Final exam:** The group project is the heart of the course. Through your efforts, with guidance and feedback from the instructor, you will learn how to make evidence-based assessments and recommendations on livestock systems sustainability (greenhouse gas emissions, adaptation, mitigation, and social implications). Groups will form early in the semester to begin the important process of team building and topic identification. Is a two-part project. In Part I, teams (2 students and 1 team with 3 students) will select contrasting livestock production system (e.g. dairy organic vs. conventional or cage free vs. cage egg production) and develop a written case-study style report reviewing recent peer review published research discussing the sustainability of the different selected systems. The written report will be the final exam of the class and it is due on Monday December 7th before 5:30pm. In Part II, each team will give a ~30-minute in-class presentation summarizing their findings reported in Part I. Further instructions and resource materials can be found in the Team project description document (I will upload it to Canvas before August 27). **Teams should seek instructor approval of your topic choice before proceeding**. Both the written material and the oral presentation will be grade on a scale of 0 to 150 pts. In calculating the final grade for the project, a 0.7 and 0.3 weighing will be given to the written material and the oral presentation, respectively. **(150 pts)**.
6. **Tentative extra points (10 pts)** will be given to students taking two online tests for the Critical Thinking Program; one at the beginning and one at the end of the semester. The points will be given independently of the score on the test as far as you spend a reasonable amount of time on the tests; the first test will be schedule during class for Thursday August 29th, the second test is taken on the week of December 9th to 13th.

How will Letter grade be assigned? A criterion-referenced grading will be used in this class and therefore you do not need to worry about your standing relative to others in this course. In fact, working together with others may be to everyone's advantage. Letter grades will be assigned according to the following scale:

Undergraduates students: A = 90%+ | B = 80 to 89% | C= 70 to 79% | D = 60 to 69 | F = 0 to 60.



Professional Etiquette Guidelines:

1. All assignments are due by the listed deadline.
2. Assignments should be typed up in a neat professional manner a) Word documents and written communication should be neatly typed and formatted (i.e. 12 pt. font and a common font style. e.g. Arial, TNR; 1" margins) b) Include your name, course, date, and assignment title with all assignments submitted c) Use quality (not quantity) writing and proper grammar to clearly communicate your understanding / obtainment of assignment objectives!! Poorly written assignments will receive a 10% deduction.
3. Include your name and course number in all e-mail correspondence.
4. Practice good professional behavior in all communications.
5. As a common courtesy to everyone in class, cellular telephones and any other communication or messaging devices are to be turned off during class time or left at home. This includes online chatting and other non-class related laptop activities. Abuse of this last policy will result in an unexcused absence and a zero being assigned for one homework grade. (Note: Text messaging, online chatting, and doing homework on laptops during class are considered an abuse of this policy).

Specific COVID-19 related information for in-person classes:

While on campus, face coverings are required in all buildings and classrooms. Face coverings are also required in outdoor spaces where physical distance cannot be guaranteed. Please be familiar with the additional information on the Healthy Clemson website, such as the use of wipes for in-person classes. If an instructor does not have a face covering or refuses to wear an approved face covering without valid accommodation, students should notify the department chair. If a student does not have a face covering or refuses to wear an approved face covering without valid accommodation, the instructor will ask the student to leave the academic space and may report the student's actions to the Office of Community & Ethical Standards as a violation of the Student Code of Conduct. If the student's actions disrupt the class to the extent that an immediate response is needed, the instructor may call the Clemson University Police Department at 656-2222.

Attendance Policy:

Clemson University undergraduate student attendance policies are available in the

undergraduate catalog. This includes sections on attendance policy, enrollment, anticipated absences, unanticipated absences, excused absences, appeals, and auditing. Lecture attendance is not mandatory. Please note the STUDENT is responsible for keeping current with assignments and any additional reading that may be assigned. The professor will be available during schedule office visits to clarify information discussed in lecture but will **not** repeat or “make up” lecture time for those who missed class. Students requesting make-up exams for an excused absence **must** provide acceptable documentation (e.g., doctor’s note or hospital admission copy form; etc.). Excused absences will be given only for illness requiring hospital admission or care by physician, university-sponsored trips and events, or for loss of an immediate family member. Several days advance notice for all non-emergency absences is required (e.g., university sponsored trips).

Topic outline for Tuesday and Thursday lectures (tentative):

1. Thursday 8-20 Course particulars, introduction.
2. Tuesday 8-25 The challenge of feeding 9 billion people.
3. Thursday 8-27 Sustainable Agriculture: Definitions and Terms.
4. Tuesday 9-2 Greenhouse gas emissions and excess nutrient excretion (N and P).
5. Thursday 9-3 Environmental sustainability and human health.
6. Tuesday 9-8 What if we got rid of livestock?
7. Thursday 9-10 Alternative proteins sources.
8. Tuesday 9-15 Overview dairy systems.
9. Thursday 9-17 Tentative Invited Speaker Dr. Buresh. Topic: Overview poultry systems.
10. Tuesday 9-22 Overview beef systems. Part 1.
11. Thursday 9-24 Overview beef systems. Part 2.
12. Tuesday 9-29 Overview swine systems.
13. Thursday 10-1 Gaseous emission from manure.
14. Tuesday 10-6 Gaseous emission from soils.
15. Thursday 10-8 Midterm (on-line).
16. Tuesday 10-13 Carbon sequestration.
17. Thursday 10-15 Environmental burden of egg, milk, and meat (poultry, pork and beef) produced in the United States and Student led discussion.
18. Tuesday 10-20 Student led discussion: Best practices and emerging options to reduce environmental impact of livestock operations.
19. Thursday 10-22 Student led discussion: Best practices and emerging options to reduce environmental impact of livestock operations.
20. Tuesday 10-27 Student led discussion: Best practices and emerging options to reduce environmental impact of livestock operations.
21. Thursday 10-29 Student led discussion: Best practices and emerging options to reduce environmental impact of livestock operations.
22. Tuesday 11-3 Fall break.
23. Thursday 11-5: Invited Speaker: Dr. Lascano. Topic: Food security.
24. Tuesday 11-10 Team case study presentation.
25. Thursday 11-12: Team case study presentation.
26. Tuesday 11-17: Team case study presentation.
27. Thursday 11-19: Team case study presentation.
28. Tuesday 11-24 and Thursday 11-26: Thanksgiving week (**no class**).
29. Tuesday 12-1 Team case study presentation.
30. Thursday 12-3 Class overview before final exam.
31. Monday 12-7 Written report due-Final Exam.

Topic outline for Tuesday lab (tentative):

1. Tuesday 8-25 Description of team debate, student led discussion and case study team project.
2. Tuesday 9-1 Invited speaker: Marguerite Helen Albro (tentative). Topic: How to conduct a literature research.
3. Tuesday 9-8 Methods to evaluate sustainability. Introduction to case studies
4. Tuesday 9-15 What is an LCA? Case study 1.
5. Tuesday 9-22 Case study 2.
6. Tuesday 9-29 Case study 3.
7. Tuesday 10-6 Team debate.
8. Tuesday 10-13 Team debate.
9. Tuesday 10-20 Team debate.
10. Tuesday 10-27 Team debate.
11. Tuesday 11-3: Fall break.
12. Tuesday 11-10: Team debate.
13. Tuesday 11-17: Invited speaker. Dr. Lascano. Topic: Food security.
14. Tuesday 11-24: Thanksgiving week.
15. Tuesday 12-1: Field trips (Tentative).

Copyright material:

Materials in courses should be considered to be copyrighted. They are intended for use only by students registered and enrolled in a particular course and only for instructional activities associated with and for the duration of the course. They may not be retained in another medium or disseminated further. They are provided in compliance with the provisions of the Teach Act. Students must seek permission from instructors to record any class activity, including lectures, discussions, and presentations. Please refer to the Use of Copyright Materials and "Fair Use Guidelines" policy on Clemson University webpage. <http://libguides.clemson.edu/copyright>.

Message from Student Accessibility Services:

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to a class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848 or by emailing studentaccess@lists.clemson.edu. Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester. You can access further information here: <http://www.clemson.edu/campus-life/campus-services/sds/>.

Clemson University Title IX (Sexual Harassment):

Title IX Policy: Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity (e.g., opposition to prohibited discrimination or participation in any process, etc.) in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. The University is committed to combatting sexual harassment and sexual violence. As a result, you should know that University faculty and staff members who work directly with students are required to report any instances of sexual harassment and sexual violence, to the University's Title IX Coordinator. What this means is that as your professor, I am required to report any incidents of sexual harassment, sexual violence or misconduct, stalking, domestic and/or relationship violence that are directly reported to me, or of which I am somehow made aware. There are two important exceptions to this requirement about which you should be aware: Confidential Resources and facilitators of sexual awareness programs such as "Take Back the Night and Aspire to be Well" when acting in those capacities, are not required to report incidents of sexual discrimination. Another important exception to the reporting requirement exists for academic work. Disclosures about sexual harassment, sexual violence, stalking, domestic and/or relationship violence that are shared as part of an academic project, a research project, class room discussion, or course assignment, are not required to be disclosed to the University's Title IX Coordinator. This policy is located at <http://www.clemson.edu/campus-life/campus-services/access/title-ix/>. Ms. Alesia Smith is the Executive Director for Equity Compliance and the Title IX Coordinator. Her office is located at 223 Holtzendorff Hall, phone number is 864.656.3181, and email address is alesias@clemson.edu.

