

INTEGRATIVE PROBLEM SOLVING PROJECT IN ANIMAL SCIENCE (AN SC 479) ANIMAL HEALTH SCIENCE (AN SC 499)

*Department of Agricultural, Food and Nutritional Science
Faculty of Agricultural, Life and Environmental Sciences
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Office hours: By appointment – send an e-mail to set up a time

Lecture/Seminar: Remote delivery Tue, Thu, 11:00 to 12:20; Zoom link on eClass

Labs: Remote delivery Thu, 14:00 to 16:50; Zoom link on eClass

Project time: The majority of lecture and lab periods are intended to be used as a meeting time for project groups and for meetings with the instructor team. The periods marked with 'TBA' or 'Project time' in the detailed schedule below can be assumed to be available for project groups to use, as needed, to complete the course outcomes (e.g., meeting with group partners, mentors, industry contacts, and course instructors). Occasionally a 'TBA' slot will be filled with a guest lecture. Students will be notified in advance of changes to the schedule. For meetings with the instructor team, information on the specific times and formats of meetings will be provided a few days before the meeting.

Lectures, meetings, and presentations will be conducted by Zoom. These Zoom sessions will not be recorded. Slides from lectures will be posted on eClass.

Meetings among group members and between group members and mentors will take place using remote meeting software and will be arranged by group members.

- Prerequisites:** ★90 registered in B.Sc. either Animal Science or Animal Health program. Students seeking a prerequisite waiver must contact the ALES Undergraduate Student Services Office (USSO).
- Calendar description:** *A team-based capstone course to explore broad areas of animal science and animal health related projects. Students will work in groups with mentors in order to gain integrative and experiential learning and develop skills related to the field.*
- Course materials:** There is no required textbook. Students are expected to use scientific journals, industry publications, strategic discussion papers, and materials provided by the teaching team and project mentors.

Learning outcomes

- Students will select and assess reference materials and use them to compose a literature review within a defined area of livestock production science or animal health science covering relevant issues which may include management, regulations, guidelines or industry practices.
- Students will integrate and build upon concepts, tools, information, and knowledge from their undergraduate programs and their literature review in order to formulate a research plan for addressing a practical problem related to animal health or animal science.
- Students will carry out their research plan in order to produce scientifically justified results and recommendations in the form of a scientific publication and one or more project deliverables. Students will choose the formats for their deliverables, to suit their target audience and the particular problem being addressed. Potential project deliverables include trade publications, web sites, scientific posters, consulting reports, informational posters, and videos.
- Throughout the course students will integrate their developing awareness of industry practices, regulations, and public perceptions acquired through ongoing discussions with mentors, team members, and course instructors into their project plans and deliverables. Students will describe their efforts in a reflective journal.

Course overview

Students will be provided with a list of issues or problems that they will address as consultants. Groups of students may be assigned or choose a project from a list, or develop their own, subject to instructor approval and availability of suitable mentors. Once projects are assigned, students will be provided with contact information for one or more project mentors: often one mentor outside of the university (referred to as the “industry mentor”) and one from within the university (referred to as the “academic mentor”). For some projects a single mentor may be involved, and as needed members of the instructor team will provide mentorship. Mentors will work with assigned students to ensure that the students understand their projects and that access to relevant information, industry contacts, and any necessary hands-on

experiences are provided in a timely manner. Mentors also assist the students in refining the technical content of the project proposal and final project report.

With assistance from mentors the course outcomes will be met through:

1. Identifying issues in the field of animal agriculture and animal health.
2. Developing a focused question that captures the essence of the problem and narrows the scope of the problem such that the student 'consulting group' can address the question during the 13 week academic term.
3. Devising a plan to deliver solutions to industry problems
 - a. Develop and orally present a project proposal
 - b. Critically evaluate interdisciplinary issues relating to their project, including, where appropriate, but not limited to:
 - i. Historical context
 - ii. Animal use and care
 - iii. Environmental stewardship, including use and production of energy
 - iv. Economic factors, cost-benefit analysis of the problem and proposed solution
 - v. Market considerations
 - vi. Socio-economic aspects of the problem and the proposed solution
 - vii. Zoonoses and public health
4. Interacting with project mentors and industry professionals.
5. Preparing a high impact final project deliverable that is solution-oriented, such as a final technical report with recommendations or findings.
6. Making oral presentations and fielding questions from a broad audience including university and industry communities.
7. Personally reflecting on the learning and discovery process by journaling thoughts and questions throughout the semester.

The projects are intended to provide experience with many aspects of the physical and social sciences as they pertain to livestock industry development or animal health (biological and animal sciences, communication, economics, social issues, consumer concerns, history, politics, etc.). The project will engage students in the development of a solution to an industry issue. This solution will include concept development, industry validation of the project's value, formulation and presentation of a project proposal based on available scientific and industry literature, and completion of a group presentation at a public colloquium, a proceedings paper, and one or more high impact solution-oriented final project deliverables.

Notes:

- *When contacting the teaching team, please start the subject line with "AN SC 479/499".*
- *For full disclosure, answers to questions raised by email that are relevant to the whole class may be posted on eClass.*

Seminar and lab schedule (subject to change)

		Lecture / Seminars	Lab (Thursday)	Assignment
Jan 12	Tue	Introduction to the course (Dr. Stothard)	Project time	
Jan 14	Thu	TBA		
Jan 19	Tue	Asking a good question (Dr. Stothard)	Project time	
Jan 21	Thu	TBA		
Jan 26	Tue	TBA	Project time	
Jan 28	Thu	Tips for successful writing (Dr. Stothard)		Progress report 1
Feb 2	Tue	TBA	Project time	Assignment 1
Feb 4	Thu	Tips for good presentations (Dr. Stothard)		
Feb 9	Tue	TBA	Project time	
Feb 11	Thu	TBA		Progress report 2
Feb 16	Tue	Reading week (no class)	Reading week (no class)	
Feb 18	Thu	Reading week (no class)		
Feb 23	Tue	Project proposal presentations; schedule for each group is to be arranged	Project proposal presentations; schedule for each group is to be arranged	Assignment 2
Feb 25	Thu	Project proposal presentations; schedule for each group is to be arranged		Project proposal presentation
Mar 2	Tue	TBA	Project time	
Mar 4	Thu	TBA		Progress report 3
Mar 9	Tue	TBA	Project time	
Mar 11	Thu	TBA		
Mar 16	Tue	A 30-min meeting with course instructors; schedule for each group is to be arranged	A 30-min meeting with course instructors; schedule for each group is to be arranged	
Mar 18	Thu	A 30-min meeting with course instructors; schedule for each group is to be arranged		Progress report 4
Mar 23	Tue	TBA	Project time	
Mar 25	Thu	TBA		
Mar 30	Tue	Capstone colloquium practice; schedule for each group is to be arranged	Capstone colloquium practice; schedule for each group is to be arranged	
Apr 1	Thu	Capstone colloquium practice; schedule for each group is to be arranged		Proceedings paper and industry deliverables
Apr 6	Tue	TBA	Project time	
Apr 8	Thu	TBA		
Apr 13	Tue	Capstone colloquium (final presentations)	Capstone colloquium (final presentations)	Capstone colloquium presentation
Apr 15	Thu	-	-	Progress report 5

Course grading

Assignment	Type	Due date	Marks	Total
Progress reports (5)	Individual Individual Individual Individual Individual	Jan 28 Feb 11 Mar 4 Mar 18 Apr 15	2 2 2 2 2	10
Project background Assignment I (literature review outline) Assignment II (literature review)	Individual Individual	Feb 2 Feb 23	5 15	20
Project proposal presentation Content Delivery and participation	Group Individual	Feb 25 Feb 25	15 5	20
Capstone project Proceedings paper Industry deliverable(s) Capstone colloquium presentation (content) Capstone colloquium presentation (delivery and participation) Participation adjustment (group work)	Group Group Group Individual Individual	Apr 1 Apr 1 Apr 13 Apr 13 Apr 13	10 20 15 5 -10 to 10	50
Total				100

Assignment due dates are specified in the table above. All assignments are due at 11:00 pm. Late assignments will be downgraded 25% per day (or portion thereof). All assignments and evaluation rubrics are available on eClass.

Written assignments and assessment

Written assignments are designed to improve your technical writing ability and help you understand industry issues.

- Unless otherwise specified, assignments are due **at 11 pm on the specified date**.
- All assignments must be uploaded to eClass. If there is a problem with eClass, send the assignment to the primary course instructor (Paul Stothard).
- Late assignments will be downgraded 50% per day (or portion thereof).
- All written and oral assignments will be graded by an instructor or TA, and may include input from project mentors.

Progress reports (individual)

AN SC 479/499 is a unique course, unlike most of the content-driven courses you've taken at University. Students will submit a series of progress reports (or reflective journals), which will document your overall experience, insights, and growth throughout the capstone process. The purpose of the progress report is to provide a way for students to continually improve. In the report, describe, reflect on, and interpret what you have done in the class. Include insights and reflections on discussions with non-university people (producers, business people, etc.); preparing and executing surveys or research projects; and other unique hands-on experiences. Students are encouraged to reflect on problems (e.g. project logistics, unexpected challenges, group dynamics, etc.), but are expected to **approach problems in a positive and constructive manner**. Implement

ideas that you discover through the reflective journaling process. You are encouraged to reevaluate changes you have made to document your progress and growth.

The journal (½ to 1 page in length, single-spaced) must be submitted to eClass. Word documents are preferred, but other electronic formats will be considered where appropriate. For each submission, students are encouraged to be creative - submit an original photograph, drawing or sketch that is symbolic of your learning journey.

The following themes are suggested if you need help getting started:

Progress report #1

- *What is on your mind regarding your capstone group project?*
- *How are the group dynamics?*

Progress report #2

- *What is on your mind regarding your capstone group project?*
- *How have your timelines worked out? What are your timelines looking like for the next two months?*
- *What can you do to make this project a huge success?*
- *How does my working style affect my performance (and my group's performance)? Am I planning far enough ahead?*

Progress report #3-4

- *Have you experienced any setbacks or challenges? How did you overcome them?*
- *Where are you at relative to your planned timelines? Are you on track?*
- *How are the group dynamics? Have you had a chance to improve the way your group works? Have you contributed positively? Missed an opportunity? Describe.*
- *Have you talked to all the right people? Will your approach give the best answer to the problem?*
- *Have you learned anything about working with people? Group members? Mentors? Industry? What works, and what do you need to improve?*
- *What is going well in my project and what is not? What do you need to change to increase your group's success?*

Progress report #5

- *Did my team work together well? What did I do or say to improve my group dynamic?*
- *If this were an advice column for future capstone students, what would you say?*
- *What key insights did you have over the term?*
- *If you were to do this again, what would you do the same? What would you change?*

Assignment 1: project background outline (individual)

An outline of literature review of your capstone project theme area using industry and scientific literature

Format: A bullet point form and a list of references

References (IMPORTANT!!): Please include at least 15 citations, of which at least 10 must be “primary” literature (original peer-reviewed papers in scientific journals), and some of these should be “authoritative reviews” of the subject area. Use of information from industry publications and media reports is also expected.) A consistent form of reference citation is expected. *Use the citation*

format for the *Journal of Animal Science* (see [JAS Instructions to Authors](#)). Full titles of papers must be included and journal names abbreviated properly. For help with journal abbreviations see the very comprehensive list at ftp://ftp.ncbi.nih.gov/pubmed/J_Medline.txt.

Assignment 2: project background (individual)

An extensive literature review of your capstone project theme area using industry and scientific literature

Format: 5000 to 8000 characters (including spaces)

Pay particular attention to providing your own critical interpretation of the literature you cite. Do not simply report the results and conclusions of other authors without adding your own comments and “linking” statements. Be specific: avoid words like “improved” or “changed”; rather use “increased” or “decreased”, and always say how much something increased or decreased.

Your mentor may guide you to a few primary sources of relevant literature to consider for your review.

Capstone outputs (group)

The proceedings paper and project deliverables must be uploaded to eClass.

1. **Proceedings paper:** This will take the format of *Journal of Animal Science* paper and will be compiled into a set of proceedings to be made available at the colloquium. This (4 pages minimum) paper will contain Abstract, Key Words, Introduction, Materials and Methods, Results and Discussion, Conclusions and Recommendations, and References. Tables and Figures must also be included, as required.
2. **Industry deliverable:** A product containing practical recommendations that address your industry’s issue in a format that would be accessed by your target audience. The format will vary with the project outcome selected; choose a format that best suits the delivery of your information. You may produce more than one industry deliverable. Suggested formats:

Consulting report: Should describe the issue addressed, approaches used, and make clear recommendations to the target audience. The report should include an executive summary.

Trade publication: Should be modeled on a trade publication from your animal theme area. It will need to include content under the following themes (and could use these as subheadings if you wish): The problem. What we did. What we found. What does it mean?

Scientific poster: Should be modeled on those used for major scientific conferences in your animal theme area. The following content is appropriate for inclusion in the poster:

- Concise statements of the problem to be addressed and the hypotheses tested or approach taken to solve the problem.
- A brief summary of the experimental model and activities used to address the problem, with scientific justification for the approach.
- Examples of the typical data obtained from your research or technical service project (or a similar completed study), presented as tables, figures, text, etc. The method of indicating the significance of the results and associated measures of variance should be included in tables or figures.
- A clear statement of the key results obtained from the project.

Documentary: This will vary with the project completed and details should be discussed with the instructors. It would be expected to include aspects of the Project Outcomes listed above.

The industry deliverables should address one or more of the following themes:

- Recommendations for a solution.
- Contributions to the economical sustainability of the industry, including a specific estimate of the economic impact of the project results in monetary terms.
- Contributions to environmental sustainability, social acceptance of food-animal production, industry growth or stability, or the human-animal bond.
- Contributions to the “pursuit of knowledge” and to furthering our fundamental understanding of animal science or animal health.

Printing costs: There may be some funds available for the printing of manuals, posters, etc. However, all purchases/expenses must be approved in advance by the Course Coordinator.

Presentation assignments and assessment

Capstone project proposal (group presentation)

The presentation file must be uploaded to eClass.

Capstone project proposal presentations will last 20 minutes (15 min for presentation and 5 min for answering questions) and will typically use a PowerPoint format. Creativity, including novel media such as video is encouraged. Present as though you are teaching the subject matter. The presentation should address the following:

- Stage the project as a ‘good question’
- Provide background about the project that you learned in Assignment 2. Include the industry importance of the project
- Describe the key objectives of the project
- Describe the approach you will take to address your key issue
- Describe project activity as a logical step by step process (Materials and Methods)
- Identify how group members will work together in the project
- Identify planned interactions with industry
- Identify the anticipated contributions to knowledge and benefits to industry
- Identify the project outputs (e.g. Proceedings + Article for an industry publication such as Canadian Poultry, Western Hog Journal, The Milk Producer, The Milk Producer, ARD Fact Sheet; a web site; poster presentation; consulting report; video, etc.)

The capstone proposal presentations will be graded by the instructors and TAs.

Capstone colloquium (group presentation)

The presentation file must be uploaded to eClass.

Group “capstone colloquium” presentations will be scheduled for 30 min (20 min for presentation and up to 10 min for answering questions). The presentation will take place in a public forum during the afternoon. Overall, the colloquium seminar is a chance for each student to show their familiarity with and contribution to the project, an appreciation of the science-based methodology employed in their project and related research, and a summary of the recommendations and impacts of the project. Colloquium presentations will be graded by the instructors and TAs. The instructors may also request feedback from mentors or AFNS faculty members attending the entire colloquium. Practice times will be available during the week preceding the final presentations.

Participation adjustment

The ability to work effectively in a group is a major objective of the capstone course. Students are encouraged to work out problems early in the term to avoid major issues later. It is very important to define individual roles (we recommend that you write them down in a form of contract), and to hold yourselves and your team members accountable. Please first try to work out issues with group dynamics with your team members, and resort to your mentor or instructors as required. Including team members in all communications is just as important as pulling your weight. **Substantial mark adjustments may occur as a result of unequal contributions toward the group project.** Adjustments are less likely if appropriate remedial steps are taken to address issues during the term.

Final grade assessment is the responsibility of the instructors and may include consultation with mentors and the course TAs. Individual grades may be adjusted for group work, based on mentor feedback, self, and peer evaluations. Letter grades will be assigned only to the final distribution of aggregate raw scores. There will be no predetermined “curving” to assign final grades but instead cut-offs for different grades will be based on real breakpoints in the overall distribution of raw marks within a class for the current academic year.

Access to representative evaluative material

Students will be given access to representative evaluative materials through eClass.

Academic integrity

“The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.governance.ualberta.ca) and avoid any behavior which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.” (GFC 2003)

Code of student behavior

All students at the University of Alberta are subject to the Code of Student Behaviour, as outlined at: <https://www.ualberta.ca/governance/resources/policies-standards-and-codes-of-conduct/code-of-student-behaviour>. Please familiarize yourself with it and ensure that you do not participate in any inappropriate behavior as defined by the Code. Key components of the code include the following statements:

30.3.2(1) No Student shall submit the words, ideas, images or data of another person as the Student’s own in any academic writing, essay, thesis, project, assignment, presentation or poster in a course or program of study.

30.3.2(2) c. No Student shall represent another’s substantial editorial or compositional assistance on an assignment as the Student’s own work.

Additional information

Policy about course outlines can be found in Course Requirements, Evaluation Procedures and Grading of the University Calendar.

Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an

approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).