

## Undergraduate Thesis in Applied Biology (APBI 499) 6 credits

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\*Registration forms and proposals are due one week before the first day of classes.\*

This course provides a means for individual students to undertake customized projects designed to provide an opportunity for students to develop and strengthen their research skills and to accommodate special research interests that cannot be met through other APBI courses.

Admission to APBI 499 is arranged through the undergraduate program advisor for the relevant major, and must be recommended by the faculty member who will be supervising the work that the student is to undertake. Students interested in APBI 499 should contact the undergraduate advisor for their major and an individual faculty member within APBI who will act as their academic supervisor. This should be done well in advance of the beginning of the academic term; for example, students should approach potential supervisors in summer regarding thesis projects to start in September. Opportunities for conducting projects are limited.

The course is based on experiential learning. You will work together with your supervisor to develop your research question and proposal, review the literature, and conduct original research.

### *Expected learning objectives*

By the end of this course you will be able to:

- demonstrate an understanding of how to develop a research proposal, to conduct research, and to analyze and present research findings;
- demonstrate your general understanding of the research area through your written literature review;
- demonstrate your understanding of your original research, including your ability to evaluate and critically analyze your results in relation to the scholarly literature, in the rest of your written thesis;
- describe and defend your research in a presentation to APBI faculty and graduate students.

### *Learning activities*

Students are expected to spend approximately 240 hours to this course (i.e. 40 h/credit). This includes time spent on the literature review, design of the study, data collection, analysis, and write-up. Regular meetings with the supervisor are required.

If required, an on-site research supervisor may also be appointed at the discretion of the academic supervisor. In such cases the research supervisor will likely serve as the secondary marker for the thesis.

If the project is associated with a summer or part-time, paid or volunteer position held by the student, care must be taken to ensure that any hours of work on the directed studies project are over and above those required of the related position. The supervisor must be satisfied that this requirement has been met. Normally, a minimum of 50% of the work required for the course must be conducted during the session in which the student is enrolled in the course.

*Course structure and schedule*

The following deadlines are suggested for students enrolled in APBI 499. The student and their supervisor must discuss and come to an agreement on deadlines at the start of the project.

<b>Milestones</b>	<b>Suggested Timelines for Sept - Apr</b>
Submission of project title and name of supervisor to undergraduate advisor	September 15
Thesis proposal to supervisor	October 1
Literature search/ Experimental Plan Draft	October 31
Literature search/ Experimental Plan Final	November 15
Thesis progress report to supervisor	January 15
Experimental/research work completed	February 15
Submission of thesis draft to supervisor	March 15
Submission of final thesis copy to supervisor	April 7
Oral presentation of thesis work	April 10

*Responsibilities of the supervisor*

- Selection of appropriate research project in conjunction with the student
- Provision of suitable laboratory supplies and equipment to perform the work
- Providing guidance on experimental design, data analysis, and presentation of results
- Giving feedback in a timely manner
- Appointing an on-site research supervisor (if necessary)
- Arranging for a secondary marker
- Scheduling the final student presentation (for APBI Faculty)

Note: the role of the supervisor in the written thesis should be restricted to general recommendations regarding structure, development, and progression of ideas, and some advice on the format of the report, grammar, spelling, etc. The involvement of the supervisor normally should be limited to the first draft.

*Responsibilities of the student*

- Make arrangements well in advance to work under the guidance of a faculty member as a thesis supervisor.
- Scheduling of regular meetings with the academic (and research) supervisor
- Adherence to deadlines and guidelines for the course, as stated in this document and arranged with the supervisor
- Submit copies of the project proposal to the project supervisor and the Undergraduate Advisor within two weeks after the start of the term. The thesis proposal (~2 pages) will consist of the following information:
  1. A clear statement of aim.
  2. The significance of the project (why is it important), supported by relevant background information and literature
  3. A brief description of the proposed research methods.
  4. Difficulties anticipated in the project.
  5. The timeline for the work (with specific milestones for completion of data collection, the literature review and the final written thesis).

Note: The thesis proposal must be approved by the undergraduate advisor within the agreed upon date or the student will be removed from the course.

### *Evaluation*

All elements will be evaluated by the academic supervisor and a secondary marker. A suggested marking scheme is provided below. This scheme may be modified by the supervisor, in consultation with the student and the secondary marker the beginning of the project.

#### Lab Work (optional; suggest a maximum of 10% weighting of final mark)

Evaluation criteria: Initiative, Technique, Comprehension, Organization, Work habits, Attention to safety/proper protocols, Dedication

#### Final Oral Presentation (required; suggest a maximum of 10% weighting of final mark)

Evaluated according to the rubric below.

#### Final Thesis (required; suggest a minimum of 80% weighting of final mark)

The thesis includes both a literature review of the topic, and a research paper describing original data collected or compiled by the student. The thesis will normally include the elements described below:

- Title page: This page contains the title, author's name, a statement as follows: "A thesis submitted in partial fulfillment of the requirements for the degree of Bachelor of Science in Applied Animal Biology", and the date, Journal format used (see example attached).
- Abstract: This is a summary of the contents of the thesis, usually 250 words or less.
- Table of Contents: This should list all major and subheadings accompanied by the page on which they are found (see example attached).

- List of Tables: The table number, caption and page on which it is found.
- List of Figures: The figure number, legend and page on which it is found are listed.
- Acknowledgements: This section thanks individuals and organizations that were helpful in the carrying out of the thesis work.
- Introduction: The introduction outlines to the reader the thesis subject, its importance, presents the specific problem of the thesis and indicates the nature of the investigation carried out.
- Literature Review: This section outlines or discusses findings reported by others relating to and leading to the topic.
- Materials and Methods: This section should describe the experimental procedures employed and the equipment and facilities used, in a manner which would allow others to duplicate the work.
- Results and Discussions: This section can be written as a combination of the two or as separate entities. The section described the results of the study, discusses these critically, and places the results into the context of the relevant literature. Tables and figures should be formatted following the instructions to authors of the journal specified on the cover page.
- Conclusions: This section reports the conclusions reached on the basis of evidence presented.
- References: Formatted following the instructions to authors of the journal specified on the cover page.
- Appendix: All data and any code used for the analysis should be made available.

### *Plagiarism*

This course involves intensive writing. Before taking the course, be aware of UBC's policy on academic integrity and plagiarism: <http://learningcommons.ubc.ca/resource-guides/avoid-plagiarism/?login>. Everything should be written "from scratch" in your own words. If you want to include exact text from any source – a paper, the internet, or another student – the material should appear in quotation marks and the source should be clearly acknowledged. Sometimes plagiarism happens accidentally, for example if someone copies material into their rough notes and then uses the notes in their own writing. To help avoid such problems we request that students use Turnitin for their final term paper, and include your Turnitin number on the title page.

### *University Policies*

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is

suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on [the UBC Senate website](#).

*(Example Title Page)*

**TITLE OF THE THESIS**

By

**Your name**

**A Thesis Submitted in Partial Fulfillment for the Requirements for the Degree of Bachelor of  
Science in Applied Biology**

Faculty of Land and Food Systems

**The University of British Columbia**

April 20XX

**This thesis is written following the instructions to authors for the journal xxx**

*(Example Table of Contents)*

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## Grading Rubric for Thesis Oral Presentation

Category/Rating	Poor (0-3)	Acceptable (3.5)	Good (4)	Excellent (5)
<b>KNOWLEDGE &amp; CONTENT</b>				
<b>Adequacy of introduction</b>	Introduction and background information was unfocused; audience did not know what the objectives of the presentation were.	Audience had an idea of the focus and objectives of the presentation, but some of the background was either missing or irrelevant.	Captured audience attention; presented adequate background; objectives were clear by the end of the introduction.	Captured audience attention; presented relevant background, quickly established a focus, and clearly stated objectives of the presentation.
<b>Explanation of experimental approach and methodology</b>	Presented procedures used without demonstrating why those methods were chosen or an understanding of the principles.	Presented overview of experimental approach, and described methods to be used.	Presented details of the chosen experimental approach; accurate description of main principles and key steps of methods.	Gave clear rationale and details for the chosen experimental approach; accurate description of main principles and key steps of methods.
<b>Explanation of results</b>	Data was not presented clearly, and/or incorrect explanations of the results were given.	Presented the data obtained from each of the methods; made a good attempt to explain the results.	Presented the data obtained from each of the methods clearly; explained the meaning of each of these results.	Presented the data obtained from each of the methods clearly; provided meaningful interpretation and inter-connections of results
<b>Clarity &amp; accuracy of discussion; Critical judgment exercised</b>	Did not show any understanding of the significance and limitations of the research findings	Gave a good effort to explain the significance and limitations of the research findings	Demonstrated good understanding of the significance and limitations of the research findings	Articulated critical judgment and good understanding of the significance and limitations of the research findings
<b>Appropriateness of conclusion and take-home message</b>	Ended the presentation abruptly; or a conclusion was presented that did not reflect the main points of the presentation.	Summarized main points of the presentation; audience left with a take-home message.	Summarized main points of the presentation; audience left with a clear take-home message; presentation concluded logically.	Summarized main points in an integrated fashion; audience left with a clear take-home message; presentation concluded logically.
<b>Response to questions</b>	Lacked accurate or relevant answers to most of the questions asked.	Made strong effort to answer questions, and handled most questions knowledgeably, but with some hesitation.	Handled most questions knowledgeably and with confidence.	Handled questions knowledgeably and with confidence; demonstrated greater depth of knowledge than what was presented.



**Organization and Delivery**

<b>Flow of information</b>	Presentation of information is disconnected; audience found it difficult to understand the main points and to follow the presentation.	Logical organization of information; some gaps or pauses in the transitions between sub-topics of group members.	Smooth and logical organization of information; transitions between sub-topics and group members were mostly effective.	Smooth and logical organization of information; effective bridging between sub-topics and among group members; easy to follow.
<b>Effectiveness of delivery</b>	Reading extensively from notes or the monitor; no eye contact with audience; low volume &/or speaking in a monotone	Spoke in a clear voice at an acceptable pace; occasionally relying on notes or the monitor; made some eye contact with the audience.	Spoke clearly, with good volume and intonation and at a good pace; established good eye contact with the audience	Spoke clearly and confidently, with good volume and intonation and at a good pace; excellent eye contact with the audience
<b>Enthusiasm, professionalism</b>	Apathetic presentation of information; distracting gestures, inappropriate demeanor and/or frequent use of slang or colloquialism	Demonstrated interest for the topic. Occasional distracting gestures or inappropriate choice of words.	Demonstrated enthusiasm for the topic; conveyed professionalism in language and demeanor.	Demonstrated a passion for the topic and instilled interest in the audience; conveyed professionalism in language and demeanor.
<b>Use of visual aids</b>	Most visual aids were too "busy", &/or had text with too small font size or verbatim to speaker's presentation.	Visual aids were used to convey information to the audience. Some slides may have been difficult to understand or see clearly.	Visual aids were attractive and effectively used to clearly convey information to the audience.	A variety of visual aids was used to capture the attention of the audience and enhance understanding of the presented information.
<b>Adherence to time limit</b>	Presentation was longer than 18 minutes or shorter than 12 minutes.	Kept to within three minutes of the prescribed 15 minute time limit	Kept to within two minutes of the prescribed 15 minute time limit.	Kept to within a minute of the prescribed 15 minute time limit!

*Last APBI 499 doc update: Dec 2019.*