FRSC 3201/BIOL 3201Applied Entomology
Course Syllabus

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Best way to contact us is via Course Message on Blackboard. You can expect a reply on Blackboard within 24 h during weekdays, up to 72 h on weekends, holidays or reading week. We can also be reached via email (vanlaerh@uwindsor.ca, or okparap@uwindsor.ca) however due to the numbers of daily emails received, response times may be as long as 1 week.

Contact hours:

Lecture (3 hrs/wk):	Video Lectures posted on Blackboard under Lecture Resources Wed 11:50am-12:50 Live Q&A and Live Breakout Brainstorming Sessions in Blackboard Virtual Classroom
Laboratory (3 hrs/wk):	Video Labs posted on Blackboard under Lab Resources Fri 9:30am-10:30am Live Q&A in Blackboard Virtual Classroom *May be opportunities for live in-person lab help depending on university Covid-19 guidelines for student access to campus*
Office hours (1 hr/wk)	Wed 1-2pm in Blackboard Virtual Classroom

What is the point of this course? What can I expect to know when I'm done?

- This course will introduce you to insects, one of the most diverse taxonomic groups on the planet, comprising millions of species that are spread across every ecosystem. Insects influence our ability to grow and store food, impact our clothing, shelters, influence our evolution and populations, teach us about societies and are useful to us as investigative tools.

- By the end of this course, you will be able to identify insects to Order and Family. You will gain these skills by learning how to collect & preserve insects, and by studying the morphology of insects.
    - Why should you care about being able to identify an insect?
        - As insects evolved into different orders and families, they differed in adaptations of how and what they feed upon and how they reproduce. This led to divergence of their morphology, physiology and relationship to insect life history (reproduction, development, and behaviour).
        - Identifying an insect tells you basic information about what the insect is likely to feed on, how it likely reproduces and where it might be found so you have an idea of whether or not it might be a pest of crops, or of humans or might be beneficial to us.
        - Many jobs such as scouting for pest/beneficial insects in field or greenhouse crops, or management of pests in buildings or yards, or looking for new invasive insects, or collecting insect evidence at a death scene rely on the basic skill of identifying insects.

- When you have completed this course, you will have a basic understanding of insect diet breadth, growth, development and reproduction, factors that impact these life history traits and insect ecology. You will have a basic understanding of how this knowledge may be utilized to create estimates of the post-mortem interval or used to predict when pests may cause human health impacts, or economic damage in agriculture or forestry.

- After completing this course, you can expect to be able to discuss the use and ethics of insects as evidence in death investigations, as beneficial insects in pest management, as vectors of disease and for understanding types of social systems at an introductory level.

- Why do you care about applications of insects?
  - There are literally hundreds of thousands of jobs relating to insects in North America, everything from summer research assistants for first year university students to PhD level positions. It ranges from conservation, zoos, museums, medicine, disease, textiles, agriculture, forestry, aquaculture, home protection, and ranges from private companies to universities and government agencies at all levels. As an example, check out https://www.ent.iastate.edu/careers

- In addition, by the end of this course, you will have worked on job-transferable skills including team-work, collaboration, critical analysis, literature research and writing.

Required Materials:

1. Text: Gullan PJ & Cranston P.S. 2014 The Insects: An outline of Entomology, 5th edition, Wiley-Blackwell Publishing
   a. Available at online retailers in various formats. May be used copies at bookstore.
2. Collection Kit: In order to get your collection kit, you will need to pick it up from the campus library via contactless pick-up. Please check blackboard for further information.
3. USB microscope: Available on amazon.ca for a range of prices, starting as low as $25. Must have ability to plug into your computer/tablet with at least 250x magnification, ability to take photo or video of what you are looking at, and a light source. A couple of examples that we have tried are:

https://www.amazon.ca/gp/product/B07XJBTNBM/ref=ppx_yo_dt_b_asin_title_o00_s00?ie=UTF8&psc=1
https://www.amazon.ca/gp/product/B00XNYXQHE/ref=ppx_yo_dt_b_asin_title_o00_s01?ie=UTF8&psc=1

Taxonomic Materials:

1. Either purchase this text: Bland R, Jacques, HE 2010. How to know the insects, 3rd edition, Waveland Press Inc (available at online retailers or may be used copies at bookstore)

2. Or utilize the following online taxonomic resources that I have collected:
   a. Information on how to collect, preserve and identify to order: https://extension.entm.purdue.edu/401Book/default.php?page=home
   b. Online virtual key to orders of insects http://www.knowyourinsects.org/keystart1.html
   c. Pictures of all the orders and families, but no key https://www.zoology.ubc.ca/entomology/main/
   d. Keys to insect families of British Columbia (except for Hymenoptera) https://ibis.geog.ubc.ca/biodiversity/efauna/InsectsofBritishColumbia.html
   e. Hymenopteran family key pdf file posted in Resources on Blackboard
   f. Keys to British Columbian Dipteran families https://www.zoology.ubc.ca/bcdiptera/Order%20Diptera%20Text%20Files/key_1_to_7.htm#:~:text=Key%20I%3A%20Families%20of%20DIPTERA%20in%20British%20Columbia&text=Wings%20well%2Ddeveloped%2C%20extending%20at,abdomen%2C%20and%20of%20normal%20shape.&text=Wings%20absent%20or%20greatly%20reduced.&text=2%20(1).,into%20a%20stylus%20or%20arista.
   g. Keys to British Columbian Hemipteran Families https://ibis.geog.ubc.ca/biodiversity/efauna/FamiliesofHemipteraofBritishColumbia.html

Grading System:

Lecture/Lab Quizzes	= 30 %	3% per quiz, after each lecture topic and lab units 2-4
Live Breakout Brainstorming Group Sessions	= 5 %	0.5% per live breakout, wks 1-11
Group Wiki Assignments	= 30 %	3% per wiki, due by 11am following Wednesday
Insect Collection	= 25 %	Digital Collection Due by 11:59pm on Dec 10 Physical Collection Due by 4pm on Dec 17
Final Exam	= 10 % =100%	Due by 11:59pm on Dec 15

Quizzes/Final Exam: Quizzes will be administered at the end of each lecture topic and the end of the lab units 2-4. Each quiz is worth 3% of your final grade and may be a combination of multiple choice, true/false, fill in the blank, definitions, matching, short answer, structure/function, hot spot or drag & drop.
The Final Exam will be a series of long-answer questions requiring you to integrate ideas across the entire course. You will receive it no later than our last live class on Dec 8th and have at least 1 week to complete it. It will be due by 11:59pm on Dec 15th.

Live Breakout Brainstorming Sessions: Every Wednesday (except Oct 13 when there is no class) from Sept 15 to Dec 8, we will meet for a live session on the Blackboard virtual classroom for one hour at 11:50am to 12:50pm. During this time, we will start with a Q&A (question & answer) session for the posted virtual lectures (15-30 minutes) and then we will divide into groups in the breakout rooms to brainstorm ideas about a question or idea that I will give you at the time (30-45 minutes). Groups will be randomly assigned at the start of the semester so that you collaborate with individuals that you may not already know. The ability to collaborate is an extremely important skill for the work-force and essential in all biological and forensic sciences as it is always a team approach. You will be able to use the whiteboard in the breakout room to write down your ideas. Make sure to save your ideas at the end of the session as you will need it to create your group Wiki for that week. You are expected to participate in your group's brainstorming session to earn 0.5% per week for the session. There will not be a breakout session during the last two live sessions, but you will have the opportunity to ask questions regarding lecture material.

Group Wiki Assignments: Based on the question or idea your group brainstormed during our live session, your group will collaborate over the next 6 days to create a Wiki entry on Blackboard (due by 11am the following Wednesday). You may include diagrams, images and text to explain your ideas. Be sure to include the sources of your information. Wikipedia itself is not an acceptable source, however primary literature (peer-reviewed journal articles), textbooks and reputable online sources such as university extension sites, government agencies or scientific societies are acceptable sources. There are 10 group wiki assignments, each worth 3% of your final grade. **Each Wiki entry records the specific contributions of each group member.** It is important that each member upload their own contribution/edits to the wiki in order to receive a grade for their contribution. A grading rubric for both content and degree of contribution is available on Blackboard.

Insect Collection: Digital Collection Blog due by 11:59pm on Dec 10th. Physical Insect Collection due by 4pm on Dec 17th. All insects must be properly pinned &/or preserved and labeled in order to be counted. Only ADULT insects can be included. Incorrectly pinned/preserved or labeled specimens will not be counted. Only insects found in Canada or USA and collected by yourself may be used in this collection. You may not purchase or otherwise obtain your insect collection from other sources. Insects must be correctly identified in order to be counted. **You need at least 2500 pts to receive the full 25% towards your grade**. Each new order is worth 75 pts and each new family is worth 25 pts. Ecological habitat and collection notes for each family (10pts per family). If the family identification is incorrect, but the order is correct, then the specimen will only be counted to order, not as a new family. Depending on the diversity of what you collect, you will likely need between 35-75 insects to complete your collection. The greater Order diversity you collect, the fewer insects you will need.

As an example: if you have 1 blow fly, correctly identified, with ecological habitat collection notes and it is the first fly you have collected, then it would be worth:

- Order = Diptera (=75 pts);
- Family = Calliphoridae (=25 pts);
- Ecological habitat & collection notes: collected from sunny trap baited with liver - adults free living, obtain protein meals from carrion; lay eggs on carrion which is why it was attracted to liver (=10 pts).

This insect would count for 110 points towards your total of 2500 pts. Overall presentation (neatness, organization etc) of the collection will be worth 100 pts.

Digital Collection – For each insect in your collection, once you have it correctly pinned, labelled and identified, use your usb microscope or other camera to take one or several photographs of your insect to show the characteristics used to identify the insect to family, document how it is pinned and the labels. **For each insect, create a blog entry** on Blackboard that includes the photographs, the label information, ecological habitat and collection notes and your identification. Please see the sample entry for ideas on how you can format each entry and what must be included. It will be VERY important that the magnification and lighting of your photos is sufficient. If you need to utilize more light sources to ensure enough contrast on your insects, an LED flashlight may provide what you need.

The last date/time to add entries to your digital collection blog is by 11:59pm on Dec 10th. You should ensure that you are adding entries throughout the semester. DO NOT WAIT UNTIL THE END!! Submission of the digital collection ensures that there is a record of your specimens and information in case of damage during submission of the physical collection. The information in your digital collection will be utilized for grading, however the grade for the collection will not finalized until receipt of the physical collection to confirm that you have collected each of the specimens included in your digital collection.

Insect Collection & Collection Kit – Your physical insect collection with specimens, as well as the remainder of the collection kit must be received **no later than 4pm on Dec 17th**. It should be delivered in person, provided physical distancing measures including masks are maintained and allowed by the university at the time. As this is a changing situation, specific delivery information will be provided by the last day of class. If your physical collection is not received, you will lose 50% of the possible collection grade.

Start EARLY! Insects disappear when the temperatures start to dip below 5-10oC at night! Don't wait to collect your specimens until the end of the semester. Be sure to check different habitats, such as in flowers, on ponds, in the soil, in leaf litter, in gardens, on shrub and tree foliage.

Illness/Emergency Reporting & Notification Policies:

Illness/Emergency Policy: The University has an official policy for how to report illness during the pandemic. The details are at the following website: http://ask.uwindsor.ca/app/answers/detail/a_id/577 Specifically, you must fill out the "Report Illness" form on that website and submit it. Please note that it is an academic offense to report a sickness if you are not, in fact, sick.

It is your responsibility to contact the professor by email or by course message, prior to the missed session, or within 24 hours of the missed live session that you have submitted an Illness Report via the above website or if you have another emergency. If notification is not provided within 24 hours, no consideration will be given and the student will receive 0 on the missed session.

Missed Due Date/Missing Collection/Missed Live Breakout Brainstorming Session Policies:

Missed Due Date Policy: Online due dates are hard deadlines. Everything (except the physical insect collection) will be turned into Blackboard. No other forms of submission will be accepted.

Missing Collection Policy: Physical Insect Collections must be received for the Insect Collection grade to be finalized. Digital insect collections that are turned in with no Physical Insect Collection will lose 50% of the possible collection grade.

Missed Live Breakout Brainstorming Session Policy: If you miss a live breakout brainstorming session, you automatically lose the 0.5% participation for the session. You may still collaborate with your group to create your wiki page for that session. It is entirely at the discretion of the professor as to whether you get the opportunity to shift the percentage of the missed session to the next session. The only conditions under which this will be considered are if you have a documented illness or documented emergency. It is up to the

professor's discretion to determine whether your reason is acceptable. In all cases, the professor reserves the right to refuse this reason as adequate or not. It is your responsibility to contact the professor by email or by course message, prior to the missed session, or within 24 hours of the missed live session that you have submitted an Illness Report via the above website or if you have another emergency. If notification is not provided within 24 hours, no consideration will be given and the student will receive 0 on the missed session.

Plagiarism and Academic Integrity Policy: Plagiarism is a serious academic offense because it dishonestly and fraudulently uses someone else's work as one's own. Students are to be evaluated on the basis of their own original work. In the preparation of essays, papers, reports, and any other types of assignments, students must necessarily rely on the work of others. However, it is imperative that the source of any ideas, wording, or data obtained from others be disclosed and properly acknowledged by citations, quotation marks, and bibliographic references in the proper format. Using the work of others without acknowledgement is plagiarism. Listing references at the end of a paper but not using in-text citations to indicate sources is plagiarism. Plagiarism includes, but is not limited to:

a) Using a passage or passages of any length from published or unpublished work of others without placing the passage(s) in quotation marks (or using indentation for long quotation(s)) and acknowledging their source;

b) Submitting work as original when that work also has been or is currently being submitted for another course, unless prior permission has been given in writing;

c) Copying material, for example, from the Internet, or purchasing material and submitting it as one's own;

d) Submitting work completely or largely identical to that of other students, unless group work and joint submissions are explicitly permitted by the instructor.

e) Submitting photographs or insect specimens purchased or obtained in any way that is not from your own work.

In cases of plagiarism, the instructor assigns a grade of 0 (F-) to the work in question. This will be decided in consultation with the AAU head. If an instructor determines that plagiarism has occurred, the student shall be informed and the case reported to the Dean of Science and the Office of Academic Integrity. Disciplinary proceedings may be initiated pursuant to Senate Bylaw 31, which could result in suspension or expulsion from the University in cases of repeated plagiarism. Students will not be allowed to re-write or re-submit work to compensate for grades assigned as a result of plagiarism. For further information regarding plagiarism and academic integrity/dishonesty policy, please see the Senate Bylaws (Bylaw 31) and Office of Academic Integrity.

SET FORMS: Student Evaluation of Teaching forms will be administered online within the last two weeks of the course.

Policy on Academic Accommodations for Students with Disabilities: Students with disabilities who require academic accommodations in this course must contact an Advisor in Student Disability Services (SDS) to complete SDS Registration and receive the necessary Letters of Accommodation. After registering with Student Disability Services, you must present your Letter of Accommodation and discuss your needs with me as early in the term as possible. Please note that deadlines for the submission of documentation and completed forms to Student Disability Services are available on their website: /disability