

# Entomology– Fall 2026

ZOOL 3430 and 3435 – 3 Credits (+1 lab)  
Utah Valley University

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## **Instructor Information**

Dr. Carl E Hjelman (he/him)  
Office: SB 242b  
Research Lab: SB 151 & 161  
Phone: (801) 863-8084  
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## **Office hours:**

Tuesdays 11:30am-12:30pm, Wednesdays 11am-11:50am, or by appointment

## **Resources:**

### **Text (required):**

Lecture: Essential Entomology 2<sup>nd</sup> edition—McGavin and Davranoglou  
Lab: Princeton Insect Field guide

Recommended: Other field guides, such as Kaufman, Audubon, Peterson, etc. may be beneficial

**Collecting Materials:** I will provide you with the basic supplies to get your collections going: Nets, forceps, pins, aspirators, vials, and other items. However, realize that there are other items that can also be used: Other nets, waders, kick screens, spreading boards, pinning blocks, blacklights, pitfall traps, and other items.

## **Course website:**

- Canvas. Additional helpful resources are also available on <https://cehjelman.github.io>
- You can access these sites from any computer linked to the internet.
- **Access to Canvas will be critical as assignments, grades, updates, and other announcements will be posted there.**

## **Course Information:**

- This course is designed to be an introductory course in entomology for students with an advanced knowledge of basic biological principles and animal diversity. We will cover broad topics in entomology including insect biology, reproduction, physiology, morphology, taxonomy, systematics, phylogenetics, and evolution. Insects are the most diverse organisms on the planet, and we will explore their scope of morphological and taxonomic variation, their specialization and diversity, and correlate all this information with major trends in insect evolution.
- This will be a rigorous course, and you will be required to learn a great deal about insect morphology, taxonomy, phylogeny, and evolution. The course is designed to interweave lectures in morphology with systematics to give you a broad view of insect diversity and evolution. You will learn many insect groups and be able to identify on sight ~75 common families, all hexapod orders, and be able to reconstruct a phylogeny for these groups at the ordinal level.
- A collection is required for the lab class. You will **need** to be very diligent at the beginning of the semester (while the weather is still good) to actively collect insects to meet this major requirement.

Recognize that this is a major time commitment on your part, and **if you start after the first freeze it will be too late.**

- You are required to sign up for the lab (ZOOL 3435) portion of this course. The first few labs will focus on insect collecting. The second set will combine insect identification with labs on internal and external morphology. You will mostly likely have time during lab for insect identification and general collection management, but **you will most likely need to spend significant time outside of class collecting insects, performing identifications, and curating your collections.**
- There will be a couple required collecting trips occurring largely during class time (**Aug 28, Sept 4**) that will occur off campus. You will need to arrange transportation for these events. More detail will be provided shortly. Other collection opportunities will likely occur. Please pay attention to canvas announcements for more information.

### **Course Objectives:**

1. Diagram the reproduction systems, embryonic development and life histories of insects.
2. Explain the ecological importance of insects, particularly their relationships to plants and other animals (including humans).
3. Apply the principles of phylogenetics and systematics to entomological diversity.
4. Construct evolutionary trees using morphological and molecular data.
5. Interpret evolutionary trees derived from morphological and molecular data.
6. Classify the major groups of insects based on images and specimens.
7. Describe the anatomy and physiology of insects.
8. Create a quality insect collection of correctly curated and identified specimens.

### **Course Procedures:**

I have provided a preliminary schedule that we will follow, it includes the sequence of topics, reading materials, assignments, etc., however, keep in mind that this schedule is subject to change. You are responsible for all announcements made in class or online, and adjustments to schedule (even if you are not there). If you miss a class or come late after announcements have been made, you are responsible to find out from another student what announcements were made and what material was covered.

### **Lecture Notes:**

Lecture notes or a power point presentation will typically be posted before lecture when possible. These notes will not cover everything said in lecture, but they should prove a useful addition to your notes for understanding and reviewing the concepts.

### **Professor Responsibilities**

It will be my goal in this course to be prepared, organized, and provide a safe, productive environment to learn. Students can be expected to be treated fairly, and with respect. Additionally, all assignments will be graded and returned in a timely manner.

I will be available outside of class time to help any students who ask for it during student hours. If for any reason you cannot meet with me during the pre-determined times, you are welcome to contact me to discuss arranging an additional meeting time. You are always welcome to come by my office, but unless it is arranged in advance, I cannot guarantee I will be available.

The best method to reach me is through e-mail, however, please be patient and recognize that you may not always receive an immediate response. I will do my best to respond in a timely manner within reasonable hours, but e-mails sent late at night will not be responded to until the next day.

### Disclaimer - Communication and Syllabus Changes

All items in this syllabus are subject to change or modification to correct errors or accommodate extenuating circumstances. You are responsible for messages sent by me and other UVU officials to your UVU email address. If you do not regularly use this address, please forward your UVU email to the address you regularly use. Please check the email for important class announcements and updates.

### Disclaimer – Artificial Intelligence and use of tools like ChatGPT

Artificial intelligence (AI) is becoming an ever-prevalent tool in society and it is important to understand how this tool works. It is important to recognize this as a “tool” and not a “crutch”. AI is prone to “hallucinating” and giving incorrect or false results; it also does not allow me to gauge **your understanding** of material. I encourage use of all resources for your work but ask that you make it your own and that you do not ask AI to complete your assignments for you. If you utilize AI, be sure to indicate it in your response that you used AI and indicate how you corrected the response and made it your own. If I feel you are not adequately responding or that you are relying on AI too much, I reserve the right to remove points on responses, up to zero credit.

### Assessment:

Your final grade will be determined by the following formula (to be determined):

| <u>Assignment</u>       | <u>% of grade</u> |
|-------------------------|-------------------|
| Quizzes and Assignments | 15                |
| Midterm Exam            | 15                |
| Midterm Lab Practical   | 5                 |
| Final Exam              | 20                |
| Lab Practical           | 15                |
| Insect collection       | 30                |
| <b>Total</b>            | <b>100</b>        |

- The class will not be graded on a curve
- Your final grade will be calculated on a percentage basis

| <u>Cutoff</u> | <u>Grade</u> | <u>Cutoff</u> | <u>Grade</u> |
|---------------|--------------|---------------|--------------|
| 93%           | A            | 73%           | C            |
| 90%           | A-           | 70%           | C-           |
| 87%           | B+           | 67%           | D+           |
| 83%           | B            | 63%           | D            |
| 80%           | B-           | 60%           | D-           |
| 77%           | C+           | <59.5%        | E            |

## Assignments and Project Descriptions

- **Midterm Exam—Due Oct. 11 (15% of final grade) :**
  - You will have one midterm exam taking place over the weekend of Oct. 8-11 (Due 11:59 pm Oct. 11). This exam will be on Canvas and will have the weekend to complete the exam, but will have a specific amount of time to complete the exam. This means once you start the exam, the clock will begin. More information will come as the exam comes closer. Expect multiple choice, short answer, matching, and long answer questions.
- **Midterm Lab Practical—Oct. 23 (5% of final grade):**
  - This lab practical, held during the regularly scheduled Friday lab, focuses on identification practice ahead of the comprehensive final lab practical. Be prepared to identify insects to order and family level, as well as identify specific morphological/anatomical sections of the insect body plan. This is a lower-stakes checkpoint intended to help you gauge your progress before the final lab practical.
- **Final Exam—Due Dec. 7 (20% of final grade)**
  - In a similar format to the midterm exam, the final exam will take place on Canvas over the window of Dec. 4 to Dec. 7 (by 11:59 pm), but you will have a specific amount of time to complete the exam once the exam starts.
- **Lab Practical Final—Dec. 4 (15% of final grade)**
  - This lab practical will focus on identification of specimens in the lab. Be prepared to identify insects to order and family level, as well as identify specific morphological/anatomical sections of the insect body plan. This will take place in the allotted lab time.
- **In-Class Quizzes/Assignments: (15% of final grade)**
  - In lab and class period, expect to see quizzes and assignments corresponding to material and readings. These may occur at the beginning of class or be part of group activities in class. These assignments are meant to gauge your understanding of the material and aid in studying for the comprehensive midterm, final, and lab practical.
- **Insect Collection—Due Dec. 4 by lab time (2 pm) (30% of final grade):**
  - You will turn in at the end of the semester a properly curated and accurately identified collection consisting of 30 families, 15 orders, and 75 specimens (these numbers are subject to change depending on how good the collecting is in the Fall).
  - The collection must consist of material you have collected yourself. While a certain amount of bartering with fellow classmates to exchange material is permitted, the intention of the collection requirement is to get you into the field to observe insects in their natural habitat, collect them, identify them, and properly curate them. **You are not allowed to use specimens that were collected by other students in prior classes or from collections assembled by others.** Just like any other university assignment, there is an expectation that the collection will be your own work. Specific details about the requirements and grading will be worked out in the future. The collection will teach you valuable skills in insect identification and teach proper curatorial techniques. Plan on spending significant amounts of time working on your collection.

### Late work:

I will keep the window for submitting assignments open, but they will accrue a 10% grade deduction daily.

I understand that life can be chaotic and there are many things outside of your control. **If you are unable to complete an assignment for any reason by the due date, please let me know and we can work something out!** Remember to always let Dr. Hjelman know if you're going to be late!

### **Cheating and plagiarism:**

I encourage students to work together to solve problems, unless otherwise explicitly stated. This does not mean copying answers. I do not tolerate cheating of any kind, including copying from another student on exams or assignments. I will impose one of several penalties for cheating that range from a warning up to assigning a failing grade for the course. Please ask me if you are not sure about what constitutes plagiarism.

### **UVU Policies and Resources**

Policies and Success Strategies (Links to an external site.)

Accessibility Services (Links to an external site.)

- Students who need accommodations because of a disability may contact the UVU Office of Accessibility Services (OAS), located on the Orem Campus in LC 312. To schedule an appointment or to speak with a counselor, call the OAS office at 801-863-8747. Deaf/Hard of Hearing individuals, email [nicole.hemmingsen@uvu.edu](mailto:nicole.hemmingsen@uvu.edu) or text 385-208-2677.

Campus Resources (Links to an external site.)

#### **Technology Support Services**

For 24/7 technical support contact Instructure's Canvas Support Live Chat (Links to an external site.) (385) 204-4930 (Available 24/7)

### **Student Care Statement**

Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to visit <https://www.uvu.edu/studentcare/> for access to a variety of resources. You may also email [care@uvu.edu](mailto:care@uvu.edu) for assistance.

All of us have a need to maintain mental health and benefit from the assistance of professionals to do so. UVU offers mental health services at very low cost (some are free). While there may be a wait list for individual counseling, group counseling may be available in some circumstances. Student Health Services is located in SC 221, telephone 801-863-8876 <https://www.uvu.edu/studenthealth/psych/>. The following community resources are available 24/7- the National Suicide Prevention Lifeline 1-800-273-8255 and the Safe UT Crisis Chat & Tip Line <https://safeut.med.utah.edu/>. You may also access the Crisis Text Line 741-741 or call 9-1-1. If an emergency is happening on campus, call campus police 801-863-5555.

### Tentative Course Schedule

Here is a tentative schedule for topics. It is your responsibility to make up any work that you might miss if absent. All readings and assignments can be found on Canvas.

| Week | Date   | Title                                                        | Topic                                      | Chapters                   |
|------|--------|--------------------------------------------------------------|--------------------------------------------|----------------------------|
| 1    | 19-Aug | It's Entomology, not Etymology                               | Syllabus, Course Intro                     |                            |
|      | 21-Aug | Lab: Hand out collections, how to collect and curate         |                                            | Section 3: pp 279-302      |
| 2    | 24-Aug | I think...                                                   | Systematics and Tree Thinking              | Section 1: pp 1-8          |
|      | 26-Aug | No... a spider is not an insect... but it's not that far off | Evolution of Insects from other arthropods | Section 1: pp 1-8          |
|      | 28-Aug | <b>Lab: Local Field Trip</b>                                 |                                            |                            |
| 3    | 31-Aug | <i>The anatomy of "outside bones"</i>                        | Insect body plans, external anatomy        | Section 1: pp 8-34         |
|      | 2-Sep  | continued external anatomy                                   |                                            |                            |
|      | 4-Sep  | <b>Lab: Local Collecting Trip (into evening)</b>             | continued external                         | Section 1: pp 8-34         |
| 4    | 7-Sep  | <b>LABOR DAY—NO CLASS</b>                                    |                                            |                            |
|      | 9-Sep  | Internal anatomy                                             | Digestion, circulation, nervous system     | Section 1: pp 8-34         |
|      | 11-Sep | Lab: Internal Anatomy, Practice Pinning and Spreading        |                                            |                            |
| 5    | 14-Sep | 3M: Mating, Metamorphosis, Molting                           | Mating, Metamorphosis, Molting             | Section 1: pp 8-34         |
|      | 16-Sep | Where do these terms keep coming from?!?                     | Insect ecology: habitats and impact        |                            |
|      | 18-Sep | <b>Lab: NHMU Collection Tour</b>                             |                                            |                            |
| 6    | 21-Sep | All these little guys, where are they hiding?                | Basal Hexapods and soil dwellers           | Section 2: pp 37-43, 60-68 |

|    |        |                                                                                                    |                                               |                                |
|----|--------|----------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------|
|    | 23-Sep | The good die young: Mayflies and evolution of wings                                                | Ephemeroptera                                 | Section 2: pp 45-51            |
|    | 25-Sep | Lab: Basal Hexapods                                                                                |                                               |                                |
| 7  | 28-Sep | House of the Dragon(flies): they don't spit fire, but....                                          | Odonata                                       | Section 2: pp 51-59            |
|    | 30-Sep | Do you want to blend in or not.....: camouflage, behavioral plasticity, and acoustic communication | Polyneoptera                                  | Section 2: pp 73-118           |
|    | 2-Oct  | Lab: Basal Hexapods and Polyneoptera                                                               |                                               |                                |
| 8  | 5-Oct  | Did you know termites are cockroaches?                                                             | Polyneoptera                                  | Section 2: pp 73-118           |
|    | 7-Oct  | What's biting trees, books, and other animals?                                                     | Psocodea                                      | Section 2: pp 123-134          |
|    | 9-Oct  | Lab: Hemiptera, Thysanoptera, Psocodea                                                             |                                               |                                |
| 9  | 12-Oct | Wait, we can get viruses from something other than mosquitos?                                      | Hemiptera                                     | Section 2: pp 134-155          |
|    | 14-Oct | Sucking and screaming: the real "bugs"                                                             |                                               |                                |
|    | 16-Oct | <b>FALL BREAK—NO CLASS</b>                                                                         |                                               |                                |
| 10 | 19-Oct | An inordinate fondness for beetles                                                                 | Coleoptera                                    | Section 2: pp 172-189          |
|    | 21-Oct | Acid, flashing lights, and chemical warfare                                                        |                                               |                                |
|    | 23-Oct | <b>Lab: Midterm Lab Practical</b>                                                                  | Practice IDs (focus: Coleoptera & Neuroptera) |                                |
| 11 | 26-Oct | Are these aliens? Plus, some ambush predators                                                      | Strepsiptera and Neuropterida                 | Section 2: pp 156-171, 189-196 |
|    | 28-Oct | Did you know that wasn't a mosquito in the Jurassic World movie?                                   | Diptera                                       | Section 2: 196-227             |
|    | 30-Oct | Lab: Hymenoptera, Trichoptera, and Lepidoptera                                                     |                                               |                                |
| 12 | 2-Nov  | Something's gotta eat that: flies and decomposition ecology                                        | Diptera, Mecoptera, Siphonaptera              | Section 2: 196-227             |
|    | 4-Nov  | Waterworld, minus Kevin Costner                                                                    | Plecoptera and Trichoptera                    | Section 2: 69-73, 228-235      |

|    |        |                                               |                           |                    |
|----|--------|-----------------------------------------------|---------------------------|--------------------|
|    | 6-Nov  | Lab: Siphonaptera, Mecoptera, Diptera         |                           |                    |
| 13 | 9-Nov  | Insect Plant Interactions                     | Insect plant interactions |                    |
|    | 11-Nov | Lepidopterans                                 | Lepidopterans             | Section 2: 235-255 |
|    | 13-Nov | Lab: Work and Collections and Practice IDs    |                           |                    |
| 14 | 16-Nov | This is how we get ants...                    |                           | Section 2: 255-277 |
|    | 18-Nov | To Bee or not to Bee                          | Hymenoptera               |                    |
|    | 20-Nov | Lab: Work on Collections and Practice IDs     |                           |                    |
| -  | 23-Nov | <b>THANKSGIVING BREAK—NO CLASS</b>            |                           |                    |
|    | 25-Nov |                                               |                           |                    |
|    | 27-Nov |                                               |                           |                    |
| 15 | 30-Nov | Do you want to build a... Phylogeny?          | Phylogeny reconstruction  |                    |
|    | 2-Dec  | Come on let's go and play                     |                           |                    |
|    | 4-Dec  | <b>Lab: Collections Due and Lab Practical</b> |                           |                    |