# Field Entomology

**University of Colorado Boulder – Mountain Research Station**
**Summer 2027 | July 12–24, 2027**

**Instructor:** Dr. Julian Resasco (he/him/his)
**Email:** jresasco@colorado.edu
**Location:** Mountain Research Station, near Nederland, Colorado
**Course number:** TBD

### What is Field Entomology?

Insects are the most diverse group of animals on Earth and play critical roles in terrestrial and freshwater ecosystems. They are pollinators, herbivores, predators, parasitoids, decomposers, and prey for many other organisms. Their diversity, abundance, and ecological importance make insects fascinating organisms to study and essential components of ecosystems.

In this course, we will explore the diversity, natural history, and ecology of insects in the southern Rocky Mountains. We will learn to recognize major insect groups, identify insects using field guides and taxonomic keys, and study their ecological roles and interactions with other organisms. We will also learn methods for observing, collecting, and sampling insects in the field.

The Mountain Research Station provides an excellent setting for studying insects across a range of habitats and elevations, from montane forests and meadows to subalpine and alpine environments. Most of our time will be spent outdoors observing insects, learning field techniques, and conducting investigations. We will complement fieldwork with lectures, discussions, laboratory identification, and student research projects.

### Course Objectives

In this course, we will embrace **learning by doing**. To learn about insects, we need to get outside, observe them, collect and identify them, and ask questions about their ecology.

Objectives of this course are to:

1. Gain an appreciation for the diversity, natural history, and ecological importance of insects.
2. Learn to recognize major insect orders and families, with an emphasis on insects of the southern Rocky Mountains.
3. Develop skills in insect observation, identification, collection, and specimen preparation, and understand the scientific value of physical specimens and photographic biodiversity records.

4. Learn field methods for sampling insect diversity, abundance, and ecological interactions.
5. Apply ecological concepts to understand insect distributions, behavior, and interactions with other organisms.
6. Develop and carry out a field research project, from asking a question and collecting data to analyzing and communicating results.
7. Hone skills in field observation, critical thinking, scientific communication, and collaborative research.

**Who Should Take This Class?**

This course is for students interested in insects, biodiversity, ecology, evolution, natural history, and field biology. It is also an opportunity to gain practical skills useful for field research and conservation work.

No prior experience with insect identification is required. A background in ecology or organismal biology will be helpful but is not essential. Curiosity, enthusiasm for learning about insects, and a willingness to spend long days outdoors are important.

**Course Format**

This is an intensive, two-week residential field course at the University of Colorado Mountain Research Station. We will meet daily, except for one day off midway through the course.

Most days will include a combination of field excursions, short lectures, discussions, and laboratory work. We will visit different habitats and elevations to observe and sample insects. We will also spend time in the laboratory using microscopes, identification keys, and reference collections to identify insects.

Some activities may take place in the evening, including nocturnal insect sampling with lights.

During the second week, students will work in small groups to design and conduct field research projects. These projects will culminate in presentations on the final day of the course.

Field excursions may involve hiking at high elevations, uneven terrain, and variable mountain weather. Students should be prepared for physically active days outdoors. We will adjust activities as needed for weather and safety.

**Course Materials**

There is no required textbook. Readings, identification resources, and other course materials will be provided electronically.

Recommended online resources include:

- iNaturalist — for documenting insect observations and exploring biodiversity records.
- BugGuide — for insect identification and natural history information.

Students should bring a field notebook, appropriate outdoor clothing, sturdy footwear, rain gear, sun protection, and a water bottle. Insect collecting and laboratory equipment will be provided.

**Evaluation**

Grades will be based on the following:

| **Component** | **Percent** |
|---|---|
| Class attendance and participation | 20% |
| Field notebook and iNaturalist observations | 20% |
| Insect identification quizzes | 20% |
| Class insect collection and identification | 20% |
| Group research project and presentation | 20% |
| **Total** | **100%** |

**Class Attendance and Participation**

Full participation, attendance, and timely arrival are expected. This is a hands-on course, and much of the learning will take place through field activities, laboratory work, and discussions. Students are expected to participate actively, work collaboratively, and contribute to a positive learning environment.

**Field Notebook and iNaturalist Observations**

Students will maintain a field notebook throughout the course, documenting field sites, insect observations, identifications, behaviors, ecological interactions, and sampling methods.

Students will also use iNaturalist to document insect diversity throughout the course. We will emphasize careful observations, informative photographs, and identification to the lowest practical taxonomic level.

Field notebooks will be checked periodically and submitted at the end of the course.

**Insect Identification Quizzes**

Students will learn to recognize major insect orders and selected families commonly encountered in Colorado. Short identification quizzes will assess the ability to recognize insects and distinguish among groups using important morphological characteristics.

**Class Insect Collection and Identification**

Physical insect specimens are important for studying biodiversity. They allow us to examine morphological characteristics that may be difficult to see in photographs, verify identifications, and preserve records of biodiversity that can be studied by future researchers.

As a class, we will build a small reference collection representing the diversity of insects encountered during the course. Students will learn techniques for collecting, preparing, labeling, and identifying specimens. We will emphasize collecting with a purpose and avoiding unnecessary killing, including limiting the number of specimens collected.

We will also make extensive use of iNaturalist to document insects through photographs and observations without collecting them. These observations will contribute to our understanding of local insect diversity and provide records that can be shared with the broader scientific community.

**Group Research Project and Presentation**

Students will work in small groups to develop and conduct an original field investigation related to insect ecology or natural history.

Projects will involve formulating a research question, developing hypotheses and predictions, designing sampling methods, collecting and analyzing data, and interpreting results.

At the end of the course, groups will present their findings in a short scientific presentation, including an introduction, methods, results, and discussion.

**Tentative Course Schedule**

The schedule is subject to change depending on weather, insect activity, etc.

**Week 1: Insect Diversity, Natural History, and Field Methods**

| Date | Topics and activities |
|---|---|
| Mon, July 12 | Introduction to field entomology. Insect diversity, morphology, and classification. Introduction to collecting and observation techniques. |
| Tue, 13 | Major insect orders and identification. Field collecting and laboratory identification. |
| Wed, 14 | Insect diversity in montane forests and meadows. Sampling methods and habitat comparisons. |
| Thu, 15 | Plant–insect interactions: herbivory, pollination, and seed predation. Field observations and sampling. |
| Fri, 16 | Aquatic insects and freshwater ecology. Sampling streams and wetlands. |
| Sat, 17 | Insect behavior and natural history. Predation, parasitism, and other interactions. Evening insect collecting with lights. |
| Sun, 18 | **Day off** |

**Week 2: Insect Ecology and Field Research**

| Date | Topics and activities |
|---|---|
| Mon, July 19 | Insect diversity along elevational gradients. Subalpine and alpine field excursion. |
| Tue, 20 | Insect community ecology and biodiversity sampling. Research questions, hypotheses, and study design. |
| Wed, 21 | Group research projects: field data collection. |
| Thu, 22 | Group research projects: additional fieldwork, specimen identification, and data analysis. |
| Fri, 23 | Research projects: analysis, interpretation, and preparation of presentations. |
| Sat, 24 | Group research presentations. Final identification activities and course synthesis. |

**Honor Code**

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the Honor Code may include but are not limited to: plagiarism (including use of paper writing services or technology [such as essay bots]), cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. Understanding the course's syllabus is a vital part in adhering to the Honor Code.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: StudentConduct@colorado.edu. Students found responsible for violating the Honor Code will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Visit Honor Code for more information on the academic integrity policy.

Accommodation for Disabilities, Temporary Medical Conditions, and Medical Isolation

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the Disability Services website. Contact Disability Services at 303-492-8671 or DSinfo@colorado.edu for further assistance. If you have a temporary medical condition, see Temporary Medical Conditions on the Disability Services website.

Accommodation for Religious Obligations

Campus policy requires faculty to provide reasonable accommodations for students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please communicate the need for a religious accommodation in a timely manner. In this class, In this class, let me know how I can accommodate.See the campus policy regarding religious observances for full details.

Preferred Student Names and Pronouns

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

Classroom Behavior

Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote, or online. Failure to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, marital status, political affiliation, or political philosophy.

For more information, see the classroom behavior policy, the Student Code of Conduct, and the Office of Institutional Equity and Compliance.

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits protected-class discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner abuse (dating or domestic violence), stalking, and related retaliation by or against members of our community on- and off-campus. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who have been subjected to misconduct can contact OIEC at 303-492-2127 or email CUreport@colorado.edu. Information about university policies, reporting options, and OIEC support resources including confidential services can be found on the OIEC website.

Please know that faculty and graduate instructors are required to inform OIEC when they are made aware of incidents related to these concerns regardless of when or where something occurred. This is to ensure that individuals impacted receive outreach from OIEC about their options and support resources. To learn more about reporting and support for a variety of concerns, visit the Don't Ignore It page.

**Mental Health and Wellness**

The University of Colorado Boulder is committed to the well-being of all students. If you are struggling with personal stressors, mental health or substance use concerns that are impacting academic or daily life, please contact Counseling and Psychiatric Services (CAPS) located in C4C or call (303) 492-2277, 24/7.

Free and unlimited telehealth is also available through Academic Live Care. The Academic Live Care site also provides information about additional wellness services on campus that are available to students.

**Acceptable Use of AI in this Class**

I ask that you do your assignments without the aid of AI programs, such as ChatGPT, because 1) responses generated by AI may be inaccurate, and 2) relying too heavily on AI can stifle your independent thinking and creativity. Learning to grapple with challenging material and developing your writing skills are critical components of a college education. Taking shortcuts by over-relying on AI tools is like going to the gym but skipping your workout; it cheats you of the opportunity to more fully engage in learning and develop essential skills.

As AI becomes more pervasive, the world risks being filled with individuals who rely on machines to do their thinking for them. In contrast, those who can think critically, solve problems independently, and approach challenges creatively will be in high demand and stand out as leaders.

*"When you're a student at a university, you should think of yourself as an athlete in training, and the job you'll do after you graduate is the sport you will compete in. You don't know specifically which sport you will play, and neither do your professors. What your professors do know is that strength training will help you. That's what essay writing is; it's strength training for the brain. Using ChatGPT to write your essays is like bringing a forklift into the weight room; you are never going to improve your cognitive fitness that way."* - Ted Chiang