Insect Classification Online
ENY 4161 / 6166

Summer and Fall Semesters Annually (3 credits)

⭐ Course Overview

The goal of this course is to provide you with a sound theoretical and practical understanding of insect diversity and the practice of classifying organisms. Lectures discuss the general principles of systematics, history of insect classification, construction and use of identification tools, nomenclature, and biology and evolutionary history of the hexapod orders. We also explore why competing classifications exist in taxonomy, and what existing classifications imply about broad patterns of evolutionary change and diversification within insects.

A collection is required that will refine your ability to identify insects to the level of order, family and species. Accumulating the required numbers of taxa will be possible only by employing a variety of collecting techniques and working with dichotomous keys. Building an insect collection, with correctly identified and curated specimens is an excellent way to learn, understand and employ the methods used by professionals to identify and classify not only insects, but living organisms in general.

📋 Student Learning Outcomes

By the end of the course, students will be able to:

🐛 **Identify** hexapods to order and the majority of common insects to family by sight.

🐛 **Identify** adult insects to order and family using dichotomous keys.

🐛 **Collect** insects and field data in different habitats using a variety of techniques.

🐛 **Curate** insect specimens properly, including labeling, pinning, point mounting, and preserving in ethanol.

🐛 **Describe** the taxonomic process: how species are described, named and classified.

🐛 **Explain** how key innovations in the life history of insects led to their incredible diversity.

🐛 **Interpret** phylogenetic trees depicting the evolutionary relationships among insects.

Course Information

Time: Asynchronous, online

Pre-requisite: A You should have taken at least a basic entomology class (ENY 3005/ 5006: Principles of Entomology, or a similar course dealing with the classification of insects.

Students are expected to be familiar with the insect orders before taking this class.

Instructor Information

Dr. Georgette Kluiters

Email: g.kluiters@ufl.edu

Phone: (352) 273-3919

Office: 2004 Steinmetz Hall

Office Hours: Due to the asynchronous nature of this course my office hours are flexible for each individual, you can schedule an appointment: calendly.com/ uf_distance_ed_coordinator

In working towards the student learning outcomes, students will foster a sense of curiosity and appreciation for communicating science to lay audiences peers or experts in the field.

Teaching Assistants

The TA for your course will be **xxx** – please direct all enquiries to **xxx** via the Canvas messaging system.
The TA for the class changes each semester as needed, please refer to the final version of this syllabus in canvas during the semester you take this course.

Readings & Course Materials

Textbooks & Readings: Triplehorn, C.A. and N.F. Johnson. 2005. Borror and DeLong's Introduction to the Study of Insects, 7th edition. Thomson Brooks/Cole, Belmont, CA. (~$80).

Instructional Methods: Course materials are organized into modules on the Canvas course website. They will include videos to view and analyze, scientific articles to read, and discussions and assignments to apply what has been learned.

Computer Requirement: This course is conducted entirely online. All students must have regular access to a computer with a reliable internet connection to access assignments and materials on Canvas.

Communication & Conduct

Meeting Policy: If you need help with any aspect of the course, we encourage you to communicate via the **Canvas Discussion Board** – if you have a question, it is likely your peers will appreciate the answer to that question too. Alternatively, you can schedule a 1-to-1 meeting with the instructors or TA. You can request a meeting with Dr. Kluiters by clicking here: calendly.com/uf_distance_ed_coordinator and with your TA via email. **Our preferred form of contact is via the Canvas course messaging system**, and we will do our best to respond to messages within 48 hours (not including weekends or holidays). As a courtesy, please check the syllabus and Canvas before reaching out; answers to many of your questions can be found there!

Canvas: Important announcements and updates will be regularly posted to the course Canvas website, so be sure to check Canvas frequently! To ensure that you do not miss anything, please ensure that your Canvas profile is set to receive notifications.

Email Accounts: It is UF policy that you use your GatorLink account or Canvas when contacting your instructors; we will not answer emails sent from other accounts (e.g., personal Gmail, Hotmail, etc).

Professional Conduct: All members of the class are expected to always conduct themselves in a professional and respectful manner. Please use appropriate etiquette when interacting with your peers and instructors, including during class, on Canvas, and via email. Students who behave disrespectfully or disruptively will be reported to the Dean of Students Office.

Suggested Schedule of Topics

Module	Topic	Lectures
1	Introduction	Introduction to Insect Classification
2	Collecting, Curating & Identifying Insects	Collecting insects
		Curating Insects
		Identifying Insects
3	Major Insect Lineages	Major Insect Lineages
		Insect Morphology
4	Early Insect Orders	Entognathous Hexapods
		Early Insect Orders
5	Insect Classification Concepts I	Systematics, Taxonomy, Classification & Phylogenetics
		Reading Phylogenetic Trees
6	Orthopteroids: Polyneoptera	Dictyoptera, Orthoptera, Phasmatodea, Dermaptera, Embioptera, Plecoptera, Zoraptera, Grylloblattodea, Mantophasmatodea
		Exam 1
7	Hemipteroids: Paraneoptera	Hemiptera: Heteroptera
		Hemiptera: Auchenorrhyncha & Sternorrhyncha
		Psocoptera, Thysanoptera, Phthiraptera & Hemiptera
8	Hymenoptera	Hymenoptera
9	Insect Classification Concepts II	History of Classification
		Zoological Nomenclature
		Species Concepts
10	Coleoptera, Neuroptera & Strepsiptera	Coleoptera, Neuroptera & Strepsiptera
11	Lepidoptera & Trichoptera	Lepidoptera & Trichoptera
12	Diptera, Siphonaptera & Mecoptera	Diptera, Siphonaptera & Mecoptera
13	Insect Evolution	Insect Evolution
		Exam 2

Schedule: This schedule is suggested to help you pace yourself through the semester. Alternatively, you may wish to review all of the orders early in the semester so you can be familiar with insect families as you collect insects and assemble your collection. **You are encouraged to work ahead of the final due dates for individual assignments**, which are listed online in the SYLLABUS tab in Canvas, as well as in the table below. Expect to dedicate approximately 10 hrs per week to lectures, assignments and preparing your collection. Past students who spent a lot of time in the field have reported logging over 300 hours over the course of the semester! Succeeding in this class does not require this much time, but managing your time well is a necessity, so plan ahead!

This schedule is just an example and dates and timings will change each semester as needed, please refer to the final version of this syllabus in canvas during the semester you take this course.

Important Due Dates for Assignments and Coursework

There are 9 quizzes due during the course, along with 5 discussion board topics – keep an eye on the due dates for these. Graduate students will also be required to produce a graduate paper, details of which can be found later in the syllabus. Make sure you have ordered your **collection equipment to arrive by the second week of the course** at the latest, so you have ample time to start your collections. Your **Mini Collection is due prior to the midpoint of the semester** and **final collection deadline is at least 2 weeks prior to the end of the semester**. To ensure your collection arrives at UF in time for that deadline we have included a **suggested submission date a week prior to this**. Any collections that arrive later than 5 pm EST on the day of the deadline will receive a penalty of 1 letter grade per day they arrive late. The deadline is strongly enforced for marking purposes so note it now!

Quiz	Discussion/ Other	Grad Paper	Collections	Exams
Course Begins				
Module 1	Module 1	Grad Paper Topic	Equipment Arranged	
Module 4	Key Activity			
	Module 5			
Module 6				Midterm Opens
			Mini Collection Deadline	Midterm Due
Module 7	Module 7			
Module 8	Module 9	Grad Paper Draft		
Module 10		Grad Paper Peer Review		
Module 11				
Module 12		Grad Paper Deadline		
			Suggested Collection Submission	
				Final Exam Opens
			Final Collection Deadline	
Module 13				Final Exam Due
Grades Due				

This timeline of assignments is just an example and dates and timings change each semester as needed, please refer to the final version of this syllabus in canvas during the semester you take this course for dates and timings associated with each of these pieces of coursework.

Grading Policies

Course Grading Scale (%)

93-100	A
90-92.9	A-
87-89.9	B+
83-86.9	B
80-82.9	B-
77-79.9	C+
73-76.9	C
70-72.9	C-
67-69.9	D+
63-66.9	D
60-62.9	D-
60-below	E

#The collection requirements differ slightly between the semesters the course is offered in. These reflect the length of each semester and insect availability.

1The lowest grade obtained in your quizzes will be dropped

Course Grading Criteria:

	Undergrad	Grad
Midterm Exam	25%	20%
Final Exam	25%	20%
Quizzes, Exercises & Discussions[1]	20%	10%
Collection (and associated documents)	30%	30%
Graduate Paper	0%	20%

Insect Collection Requirements: Summer#

	Undergrad	Grad
# Orders	18	22
# Families	80	100
# Species Identifications	12	16

Insect Collection Requirements: Fall#

	Undergrad	Grad
# Orders	18	22
# Families	100	120
# Species Identifications	14	21

Please note that the instructors do not round up grades— requests to do so will not be considered.

For current UF policies on assigning grade points, consult the following policy website:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Disputing a grade: If you wish to dispute a grade for any exam/assignment, you must contact the instructors in writing within two days (48 hours) after the assignment has been returned. In your message, you must include a specific explanation for why you think the grade is incorrect and how you think it should be changed. An instructor will then arrange a meeting with you to discuss the issue and determine whether or not to the grade should be changed. The grade assigned following this meeting will be final.

Methods By Which Students Will Be Evaluated and Grades Determined

Students are responsible for all material distributed or discussed online. Make sure to check the website regularly for any changes or announcements. It is your responsibility to pace yourself throughout the course. Due dates listed on the website are firm. Make-ups (for quizzes, exercises, discussions and exams) are not given except under pre-arranged or university approved circumstances, this is consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.
If you have a conflict or problem, letting me know ahead of time may be all it takes to reach an arrangement.

Succeeding in this Class:

Collect, collect, collect! Success in this course is largely linked to the effort you make to collect insects in diverse environments *early* in the semester. Keep in mind that the more orders and families you have, the more specimens you have for studying key morphological characters of these groups. Even if the weather is not perfect, you can find a lot of diversity once you start looking. Don't overlook urban environments and indoor habitats such as homes and greenhouses, especially if it is cold outside! Plan to collect many more insects than the required number of Orders, Families and Species. This is because many of your insects will belong to the same families, but you won't know this until you have curated and identified them.

Plan ahead. Plan to collect intensively for the first third of the course, curating specimens as you go and identifying insects in the groups that you are learning about in lecture. After about 5 weeks, switch your focus to the *identification* of specimens that you have already collected and curated. This will allow you to become familiar with the identification keys in the textbook using your own specimens. As you learn to recognize common families, your collecting can become more targeted as you search for groups not yet included in your collection.

Access a scope. The diagnostic features of many insects are small and can be best seen under magnification. It is assumed that you will have access to a dissecting microscope for this course. If you are in Gainesville you can contact me to arrange access to a scope in Entomology. Alternatively, contact a scientific laboratory or a high school science classroom to request use of their equipment. A high-quality hand lens (20X) can also be a great help in the field.

Online courses. Important due dates for this course are provided online, and it is your responsibility to be aware of them and plan your time accordingly. Read the Important Course Information on the course website, where there is a section about Succeeding in Online Courses.

Projects, Assignments, & Exams

Collecting:
Collect, Collect, Collect! This is the most important piece of advice for your success with your insect collection. Collect MANY MORE insects than you expect to include in your final collection. Generally, you can expect to collect different types of insects with different sampling methods in different habitats, however, you will not necessarily know what kinds of insects you have collected until they are curated and identified.

During this semester you will collect using different techniques in a variety of habitats to maximize your exposure to insect diversity. This also maximizes the risk of coming across something that could harm you. Ticks, chiggers, spiders, biting flies, reptiles, plants and other environmental hazards may be encountered during these trips, so dress accordingly. Insect/tick repellant and sunscreen may also necessary as you go collecting, along with snacks and water.

Collecting Equipment:

Many of you will want to buy your own collection and curation equipment. However, if you are in Gainesville, you have the option of borrowing equipment from the Entomology department stockroom (Entomology Rm 2326). Gainesville students pay an equipment fee equivalent to what distance students end up paying for their equipment. To check out equipment for the semester, including pins, boxes, vials, net, spreading board, etc., contact Nic Hostettler (352-273-3979 or nhr@ufl.edu) who will be happy to assist - just let him know you are taking Insect Classification this semester. Just remember borrowed collecting equipment must be returned by the end of the semester! Failure to return equipment can result in a hold on your record.

Quizzes, Exercises and Discussions:

Quizzes, exercises and discussions are designed to improve and test your understanding of lecture material and insect recognition. Q*uizzes*. One online sight-ID quiz is associated with each insect- ID module. These are designed to test your ability to identify insects by sight. Quizzes are short, so you will be expected to recognize the insects quickly, without consulting references. *Quizzes must be taken by the due date, and may not be made up without prior approval or a valid excuse. Exercises* reinforce concepts from lecture by giving you a chance to apply your knowledge. Each exercise will have specific instructions provided on the website. *Discussions* give the class an opportunity to share ideas and interact online. Please follow basic rules of 'nettiquette' by being respectful of diverse opinions and using proper grammar.

Exams:

Exams cover material related to insect identification (sight ID and Key Out) as well as concepts covered in lecture. Exams will test your ability to identify insect orders and families by sight and by using the keys in our textbook, as well as your mastery of lecture material. The final exam will focus on lecture material from the second half of the semester, but will test your ability to identify orders from the entire course. Students who miss an exam without a valid excuse will receive an exam grade of zero. **Technical Difficulty Policy:** If you have technical trouble with an exam, you must contact the UF Computing Help Desk (http://helpdesk.ufl.edu) and obtain a ticket number BEFORE contacting the instructor. Requests to re-take an exam from a student without an IT Help Desk ticket number will not be considered.

Graduate paper:

Each graduate student will complete a report focused on insects in one of the following three formats: 1) life history and classification of an insect species in the style of the Featured Creatures pages at http://entnemdept.ufl.edu/creatures , 2) literature review of the published literature on a taxon of your choice, or 3) proposal for a formally recognized insect common name, crafted according to the guidelines of the Entomological Society of America's Common Names of Insects Committee. https://www.entsoc.org/pubs/use-and-submission-common-names. Details about these assignments can be found on the course Canvas site.

Grad Paper Grading Criteria:

Content	20%
Format	20%
Writing	20%
References	20%
Peer Review	20%

Collection Requirements:
Collection requirements are detailed in the Collection Requirements Document. Collections are based on adult insects and must include the following documents: 1) Collection contents list, 2) Citation List, 3) Key characters to species IDs and 4) Field Notes. *Collections submitted without these documents will not be graded and will receive a grade of zero.*

Mini collection:
The mini collection is just that – a **miniature version** of your final collection. This assignment provides a benchmark to ensure you don't leave all your collecting and curation until the end of the course and gives you feedback early in the course. You will submit **photos** of your mini- collection, with specimens representing **at least 10 orders, 5 families and 2 species, all correctly identified, curated and labeled**. In addition to pinned insects, your collection must include at least one point-mounted or double mounted specimen and one specimen with the wings spread. **A Collection Contents List, your field notes so far and references with key characters for your species-level IDs are also required as part of the Mini Collection** (see requirements for main collection for details of how to format them). As with your full collection requirement, please arrange the specimens with orders arranged phylogenetically (i.e., in the order found in the textbook) and identify each Order-level grouping with header labels pinned to the bottom of your box.

Suggested references:
Our textbook is the only *required* book for this course, however, there are many excellent resources available for learning about and identifying insects. You will need to seek out references to identify your insects to species-level, so look for papers, guides and websites with dichotomous keys and high quality identification information, not just photographs. Try to use up to date references as older ones may use outdated classification. The following references are the types of textbooks and identification guides that you might find helpful.

> **Textbooks:**
> Daly & Doyen's Introduction to Insect Biology and Diversity. Whitfield & Purcell, 2012. ~ $119.
> The Insects: An Outline of Entomology, 5th Ed. P. J. Gullan, P. S. Cranston. 2014. ~ $100.
>
> **Websites:** NOTE: Do Not Rely On Websites Alone! There are many excellent websites that can be helpful in identifying insects, but some are more reliable than others, such as http://entnemdept.ufl.edu/creatures/ and www.bugguide.org (but use with caution!)

Extra Credit: Extra credit assignments may be posted at the **instructors' discretion only**.

Attendance & Participation

There is no synchronized class time, but all assignments must be completed by their specified due dates, posted on the Canvas course site and shown in this syllabus. Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic- regulations/attendance-policies/.

Late Work & Make-Up Assignments

Assignment Policy: Assignments have specific due dates that are spread out over the course of the semester so as not to overload you at any particular time in the semester. All materials will be available at the beginning of the semester so feel free to work ahead and submit assignments early if you need to accommodate your personal schedule. All assignments have specific due dates that will be posted on the Canvas course site and are shown in this syllabus. Assignments turned in after the due date and time will lose 10% of their value each day. *Assignment deadlines are firm unless an extension has been granted by the instructor, and* **any major assignment submitted late will receive a penalty of one letter grade per day**. *Alternative means of submission (e.g., emailing assignments to an instructor) will not be accepted.*

> *Submitting assignments:*
>
> *You are responsible for ensuring that all your work is uploaded <u>correctly and</u> <u>completely</u> by the deadline. Corrupted files will be treated as <u>missing work</u> (= 0 grade) until they are reuploaded correctly and late penalties will apply if your resubmission is past the deadline. So, please always double check your files right after you upload them! If you experience technical problems when submitting your work in Canvas, contact the UF Computing Help Desk for assistance: https://helpdesk.ufl.edu.*

Make-Up Policy: All assignments must be submitted **by the due date and time indicated on Canvas**. There are no provisions for make-up assignments. The assignments can be submitted early to work around work or personal obligations. The policy for late submission of assignments is shown above. However, if the student misses the deadline for an assignment due to a medical or family emergency (accompanied by a note from a medical professional), the late assignment penalty will be waived.

Extensions will be considered on a *case-by-case basis* (at the instructors' discretion) only in the event of unforeseen emergencies. In such a case, you must contact the instructors as soon as possible to discuss the situation prior to the deadline; note that the instructors may request documentation. No extensions will be granted for students who miss the due date for any other reason.

> *A note about deadlines: Remember, the due date doesn't have to be the "do" date! In other words, we encourage you to work on your assignments in advance– don't wait until right before the deadline to submit your work! Last-minute computer problems or other non-emergency situations that arise right before the deadline are <u>not</u> valid reasons for requesting an extension; such requests will not be considered and late penalties will be applied to your work if it is not submitted before the deadline.*

Regrade Policy: If you believe an error has been made in calculating your grade for any assignment, you may submit a re-grade request in writing. Please provide a written description detailing the problem within one week of receiving your grade. Submit the original item with the request and note that the entire assignment will be re-evaluated.

⛉ University Policy on Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the **Honor Code**, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."*

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

Class Demeanor or Nettiquette: All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions, and chats. See the Netiquette Guide for Online Courses

Instructors' note: Any action that subverts the learning goals of the course (or a particular course activity) will be treated as academic misconduct and reported to the Dean of Students Office. This includes– but is not limited to– cheating or assisting others in cheating, plagiarism (i.e., misrepresenting someone else's work as your own, whether it is copied directly or paraphrased), self-plagiarism (i.e., copying/reusing work that you have submitted previously), collaborating with others when it is not permitted, fabricating data, lying to an instructor, and bad faith attempts to undermine the intent of an learning activity. In addition to being reported to the Dean of Students Office, a student will earn a grade of 0 on any assignment that is plagiarized or that otherwise violates these academic honesty policies. This 0 grade is irreversible– it cannot be dropped and the assignment cannot be resubmitted for a different grade. After this, any subsequent incidents of plagiarism or academic honesty will result in an automatic E (= failing grade) in the course.

⛏ Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Accommodations for Students with Disabilities

The **Disability Resource Center** coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services, and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation.

Disability Resource Center

001 Reid Hall
(352) 392-8565 | https://disability.ufl.edu/

Instructors' note: We want you to succeed in this course! To ensure your accommodations are in place when you need them, please be sure to have your DRC accommodation letter sent to us as early as possible– ideally at the beginning of the semester.

Course Evaluations

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via **GatorEvals**. Guidance on how to give feedback in a professional and respectful manner is available at: https://gatorevals.aa.ufl.edu/ students/. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at: https://gatorevals.aa.ufl.edu/public-results/.

Technical Help

For issues with technical difficulties for Canvas, please contact the UF Help Desk at:

● http://helpdesk.ufl.edu

● (352) 392-HELP (4357)

Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from the Help Desk when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university's counseling resources. **The Counseling & Wellness Center** provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance:

> **University Counseling & Wellness Center**
> Counseling Services, Groups and Workshops, Outreach and Consultation, Self-Help Library, Wellness Coaching
>
> 3190 Radio Road
> (352) 392-1575; https://counseling.ufl.edu

Other campus resources include:

> **U Matter, We Care**: http://umatter.ufl.edu
>
> **Career Connections Center**: Reitz Student Union- First Floor; (352) 392-1601; http://career.ufl.edu
>
> **Student Success Initiative**:   http://studentsuccess.ufl.edu
>
> **Student Complaints**: Complaints regarding on-campus courses may be filed at https://sccr.dso.ufl.edu/policies/student-honor-code-studentconduct-code/. For online courses, please see https://distance.ufl.edu/getting-help/student-complaint-process/

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It is your responsibility to ensure that you fully understand the policies outlined in this syllabus as well as the policies of the university as they relate to this course. By remaining enrolled in this course, you agree that you have read and understood all of these policies and that you will be held accountable to them.

At their discretion, the instructors may change aspects of the course during the semester to accommodate new opportunities, unforeseen disruptions, or other circumstances. These changes will be communicated clearly in class and through Canvas. The current version of the syllabus will always be available on our course's Canvas website. It is your responsibility to ensure that you are following the most recent version of the syllabus.

If you have any questions, please contact the instructors as soon as possible (preferably at the beginning of the course)!