RUTGERS Department of Entomology

Syllabus for (11:370:381)

INSECT BIOLOGY

(4.0 credits)

Instructor: Dr. Chloe Hawkings
Location: Blake Hall, room 101
Course Overview : Insect biology is the study of insect evolution, diversity, structure, function as well as an assessment of insects and their agricultural, economic, and medical significance.
Number of credit hours : Four (4)
Days and times of lectures : M, W (2:15 - 3:35 pm, 12:35 - 5:15pm) Lec/Lab
Office hours : By appointment
Office location: Thompson Hall, Room 132
Email: c.hawkings@rutgers.edu
Prerequisites : 01:119:101-102; (11:370:202 suggested for students not familiar with Entomology)

Course Description : This course will introduce students to basic insect biology, evolution, and comparative taxonomy. Insects impact society through their role as pests of agricultural, medical, and urban sectors as well as their beneficial roles in ecosystems and as biological control for invasive pests. We will also cover how insects, such as the fruit fly pose as excellent models for scientific research.

Learning outcomes :
1. Students should be able to define key concepts relating to insect biology and evolution covered in lecture materials.
2. Students should be able to classify and identify insects to the level of Order.
3. Students should be able to apply course material to demonstrate their ability to solve real world problems.
4. Students should be able to examine scientific studies to draw connections between lecture material and current research to draw conclusions on the need for research.
5. Students should be able to produce original work to investigate an insect its significance to their field.

Resources :
Textbook: Gossner, M. M. (2012). Daly and Doyen's Introduction to Insect Biology and Diversity. James B. Whitfield and Alexander H. Purcell III.
Articles: Leonhardt, S. D., Menzel, F., Nehring, V., & Schmitt, T. (2016). Ecology and evolution of communication in social insects. *Cell* , *164* (6), 1277-1287.
Sheikh, A. A., Rehman, N. Z., & Kumar, R. (2017). Diverse adaptations in insects: A Review. *J. Entomol. Zool. Stud.* , *5* (2), 343-350.
Laroche, M., Bérenger, J. M., Delaunay, P., Charrel, R., Pradines, B., Berger, F., ... & Parola, P. (2017). Medical entomology: a reemerging field of research to better understand vector-borne infectious diseases. *Clinical Infectious Diseases* , *65* (suppl_1), S30-S38.

Course Calendar:
Sept. 4: Introduction (Chapters 1)
Sept. 9: The Insect Body (Chapter 2)
Sept. 11: The Insect Body II (Chapter 2)
Sept. 16: The Integument (Chapter 3) (**QUIZ 1**)
Sept. 18: Development and Reproduction (Chapter 4)
Sept. 23: Insects and Pop Culture. **Guest Lecturer:** Dr George Hamilton
Sept. 25: Maintenance and Movement (Chapter 5)
Sept. 30: Reception of Stimuli/Integration of Activities (Chapter 6)
Oct. 2: Social Relationships (Chapter 7) (**QUIZ 2**)
Oct. 7: Diversity/Adaptations (Chapter 8)
Oct. 9: Forensic Entomology; **Case Study Assignment Due**
Oct. 14: Insect-Plant Interactions (Chapter 9)
Oct. 16: Entomophagous Insects/Insects and Microbes (Chapters 10-11) (**QUIZ 3**)
Oct. 21: Medical & Veterinary Entomology (Chapters 12)
Oct. 23: Pest Management (Chapter 13)
Oct. 28: Midterm Exam
Oct. 30: Evolutionary Perspective (Chapter 16)
Nov. 4: Protura/Collembola/Diplura (Chapter 18)
Nov. 6: Archeognatha/Thysanura/Ephemeroptera (Chapters 19-20)
Nov. 11: Odonata/Blattodea/Mantodea (Chapters 21-23) (**QUIZ 4**)
Nov. 13: Grylloblattodea/Mantophasmatodea/Dermaptera/Plecoptera (Chapters 24-27)
Nov. 18: Embiidina/Orthoptera/Phasmatodea/Zoraptera (Chapters 28-31)
Nov. 20: Psocoptera/Phthriraptera/Hemiptera (Chapters 32-34)
Nov. 25: Thysanoptera/Megaloptera/Raphidioptera/Neuroptera (Chapters 35-38) (**QUIZ 5**)
Nov. 27: Coleoptera/Strepsiptera (Chapters 39-40)
Dec. 2: Hymenoptera/Mecoptera (Chapters 41-42)
Dec. 4: Diptera/Siphonaptera (Chapters 43-44))
Dec. 9: Lepidoptera/Trichoptera (Chapters 45-46)
Dec. 11: Class end
Dec. 16 - 23: Final Exam

Grading and assignment:
Exams: Two one-hour exams consisting of both multiple choice and essay style questions which cover material from lectures prior to the exam. The final exam is cumulative and covers all lecture material.
Assignments: A case study reading assignment will be given in which students will summarize the contents and complete outside of class. Assignments are aimed to encourage students to understand the course content and scientific literature in a way which can be articulated to other scientists. Students are expected to contribute to class discussions after reading.
Quizzes: Five quizzes will be assigned at the beginning of class to be completed before the lecture begins
Case Study Assignment: The case study is a writing exercise that will allow students to investigate applications of entomology within their major studies. For this project students will discuss a specific insect and its significance to their field of study. The assignment will be limited to a two-page report where relevant scientific publications are discussed and cited to highlight the importance of an insect. The stylistic aspect of your assignment is up to the student's discretion. If problems should arise in choosing a topic please notify the instructor immediately.
Total % contributed (course):
Midterm Exam 20%
Final Exam 25%
Lab 25%
Quizzes (2% each) 10%

Case Study Assignment 10%
Participation/discussions 10%
Total % contributed (lab):
Collection 50%
Quizzes (15% each) 30%
Participation 10%
Attendance 10%

Course Etiquette: Attendance is recommended, and participation is required for participation points. This requires participation in class activities, discussions, and questions. A strict late policy is followed in this class, lateness is regarded as absence. Quizzes and handling of grades and assignments will be conducted at the start of the lecture. If you are going to be late, let the instructor know immediately. If you miss a lecture you are responsible for catching up in time for assignments and exams. Missed exams and tests can only be excused through university approved absences. The instructor should be provided proof of university approval no more than one week after the exam date. No disturbances will be tolerated in class, this includes engaging in disruptive behavior and inappropriate cell phone or laptop use that is not related to the course. We strive to create a positive classroom climate to facilitate all students to be able to learn.

Americans with Disabilities Act (1990): The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please visit the Office of Disability Services or contact their office for further information.

Academic Integrity: The University's policy on Academic Integrity is available at http://academicintegrity.rutgers.edu/academicintegrity-policy. The principles of academic integrity require that a student: properly acknowledge and cite all use of the ideas, results, or words of others. You must acknowledge **all** contributors to a given piece of work. All work submitted for a course or other academic activity must be produced by the student turning in the assignment or task and is produced without the aid of impermissible materials or impermissible collaboration. All data or results must be obtained by ethical means and reported accurately without suppressing any results inconsistent with his or her interpretation or conclusions. Treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress. You are expected to uphold the canons of the ethical or professional code of the profession for which he or she is preparing. Adherence to these principles is necessary in order to ensure that everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments. all student work is fairly evaluated and no student has an inappropriate advantage over others. The reputation of the University for integrity in its teaching, research, and scholarship will be maintained and enhanced. Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.