Applied Entomology - Biology 4500

Course Syllabus - Spring 2021

Instructor: Mark (Cody) Holthouse, e-mail: cody.holthouse@usu.edu

Lab Instructor: Brandon Claridge, e-mail: brandon.claridge@usu.edu

Office Hours: Holthouse email or zoom appointments by request (preferred times M & W after lecture)
Claridge email or zoom appointments by request

Lecture: Monday, Wednesday 11:30 am -12:20 pm ZOOM (Virtual)
Laboratory: Tuesday or Thursday 2:30-5:20 pm Life Science Building Room 219


**Textbooks are recommended, not required**

Course Objectives: Students will learn fundamentals of insect biology, with emphasis on insects of economic importance and principles and tactics of pest management. In the laboratory, students will learn basic classification and habits of insects, particularly those of beneficial and harmful insects affecting humans and agriculture. Field trips (if possible with new COVID-19 protocols) will introduce students to applied aspects of entomology and insect pest management (prerequisite: Introductory Biology – BIOL 1610/1615 or equivalent).

Participation: The course consists of weekly lectures and labs. Attendance and participation in both lectures and labs are required. Lectures will be delivered virtually through Zoom video meetings. All lecture materials will be available through Canvas and it is your responsibility to look for assignments and associated due dates there. Laboratory sessions will be in person and abide by all USU COVID-19 (https://www.usu.edu/covid-19/) safety protocols. If you cannot attend a given laboratory session, discuss your necessary absence from the lab with the instructor in advance. If you find yourself feeling ill or displaying any symptoms (https://www.usu.edu/covid-19/if-
you-are-sick/) of COVID-19, we ask that you not attend lab and instead email your lab instructor and fill out the COVID-19 questionnaire (https://usu.service-now.com/dashboard?id=covid_questionnaire&sys_id=25a86b35db625010bb89e25c13961990) as soon as possible.

**Evaluation Methods and Criteria**

- Lecture Quizzes 5%
- Lecture Midterm Exam I 17%
- Lecture Midterm Exam II 17%
- Comprehensive Final Exam 25%

- Lab Quizzes 6%
- Lab Worksheets 5%
- Laboratory Midterm 10%
- Laboratory Final 15%

**Grade Scheme**

The following grading standards will be used in this class:

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<thead>
<tr>
<th>Grade</th>
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<tr>
<td>A</td>
<td>100 % to 93.0%</td>
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<tr>
<td>A-</td>
<td>&lt; 93.0 % to 90.0%</td>
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<td>B+</td>
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Schedule for Lectures and Lab

*(Tentative schedule, check for regular updates as the semester progresses. Asterisks * denote tentative guest speaker)*

Wk 1

1  M  Jan 18  NO SCHOOL *Martin Luther King, Jr. Day*

2  W  Jan 20  Introduction to Applied Entomology

Wk 2

3  M  Jan 25  Introduction to insects and other arthropods (e.g., spiders and mites)

4  W  Jan 27  The insect body [wings, legs]

Tu, Th  Jan 26, 28  **Lab 1: Orthoptera, Blattodea, Phasmatodea**

Wk 3

5  M  Feb 1  Insect life cycles and development

6  W  Feb 3  Life processes: eating, breathing, …

Tu, Th  Feb 2, 4  **Lab 2: Hemiptera (suborder Heteroptera)**

Wk 4

7  M  Feb 8  Life processes: molting and metamorphosis

8  W  Feb 10  Life processes: Nervous system and sensing the environment

Tu, Th  Feb 9, 11  **Lab 3: Hemiptera (suborders Auchenorrhyncha & Sternorrhyncha)**

Wk 5

9  M  Feb 15  NO SCHOOL *Presidents' Day*

10  W  Feb 17  ***** LECTURE EXAM I *****

Tu, Th  Feb 16, 18  **Lab 4: Miscellaneous Exopterygote orders, begin Coleoptera**

Wk 6

11  M  Feb 22  Life processes: reproduction

12  W  Feb 24  Insect pest management (IPM): overview

Tu, Th  Feb 23, 25  **Lab 5: Finish Coleoptera**
Wk 7 13 M Mar 1 Insect ecology: seasonal cycles
14 W Mar 3 Insect Ecology (finish) and Insect Behavior (begin)
          Tu, Th Mar 2, 4 LAB MIDTERM

Wk 8 15 M Mar 8 Insect Behavior
16 W Mar 10 USDA APHIS programs for invasive pest insects (*Dawn Holzer*)
          Tu, Th Mar 9, 11 Lab: Diptera, Siphonaptera

Wk 9 17 M Mar 15 Biological control: parasitoids and predators
18 W Mar 17 Biological control (*Zach Schumm*)
          Tu, Th Mar 16, 18 Lab: Lepidoptera, Neuroptera

Wk 10 19 M Mar 22 Biological control: strategies
20 W Mar 24 **** LECTURE EXAM II ****
          Tu, Th Mar 23, 25 Lab: Hymenoptera, Isoptera

Wk 11 21 M Mar 29 Plant-insect interactions and Host Plant Resistance
          Tu Mar 30 Lab: Collembola, Thysanura and Arachnids
22 W Mar 31 Monitoring invasive pest insects in Utah (*Lori Spears*)
          Th Apr 1 Lab: Collembola, Thysanura and Arachnids

Wk 12 23 M Apr 5 Conventional insecticides I
24 W Apr 7 Conventional insecticides II, IGRs
          Tu, Th Apr 6, 8 Lab: Review

Wk 13 25 M Apr 12 Insecticide Resistance – Causes (*Ricardo Ramirez*)
26 W Apr 14 Insecticide Resistance Management (*Ricardo Ramirez*)
          Tu, Th Apr 13, 15 LAB FINAL

Wk 14 27 M Apr 19 Case study of major urban pests (*TBD*)
28 W Apr 21 IPM programs in Utah (*Diane Alston*)
Library Services

All USU students attending classes in Logan, at our Regional Campuses, or online can access all databases, e-journals, and e-books regardless of location. Additionally, the library will mail printed books to students, at no charge to them. Students can also borrow books from any Utah academic library. Take advantage of all library services and learn more at libguides.usu.edu/rc. (http://libguides.usu.edu/rc)

Classroom Civility

Utah State University supports the principle of freedom of expression for both faculty and students. The University respects the rights of faculty to teach and students to learn. Maintenance of these rights requires classroom conditions that do not impede the learning process. Disruptive classroom behavior will not be tolerated. An individual engaging in such behavior may be subject to disciplinary action. Read Student Code Article V Section V-3 (https://studentconduct.usu.edu/studentcode/article5) for more information.

University Policies & Procedures

COVID-19 Classroom Protocols

In order to continue to provide a high standard of instruction at USU, and to limit the spread of COVID-19 during the pandemic, students are asked to follow certain classroom protocols. These protocols are in place not only for your safety but also the safety of the rest of the campus community. You will be asked to clean your desk area at the start of each class, sit in designated seats, wear face coverings, and follow dismission instructions. There may be individual medical circumstances that prevent some students from using face coverings. These circumstances will be rare, but if they do exist, we ask that everyone be respectful. It is imperative that we each do our part so that on-campus instruction can continue.

Academic Freedom and Professional Responsibilities

Academic freedom is the right to teach, study, discuss, investigate, discover, create, and publish freely. Academic freedom protects the rights of faculty members in teaching and of students in learning. Freedom in research is fundamental to the advancement of truth. Faculty members are entitled to full freedom in teaching, research, and creative activities, subject to the limitations imposed by professional responsibility. Faculty Code Policy #403 (http://www.usu.edu/hr/files/uploads/Policies/403.pdf) further defines academic freedom and professional responsibilities.

Academic Integrity – "The Honor System"
Each student has the right and duty to pursue his or her academic experience free of dishonesty. To enhance the learning environment at Utah State University and to develop student academic integrity, each student agrees to the following Honor Pledge:

"I pledge, on my honor, to conduct myself with the foremost level of academic integrity."

A student who lives by the Honor Pledge is a student who does more than not cheat, falsify, or plagiarize. A student who lives by the Honor Pledge:

- Espouses academic integrity as an underlying and essential principle of the Utah State University community;
- Understands that each act of academic dishonesty devalues every degree that is awarded by this institution; and
- Is a welcomed and valued member of Utah State University.

**Academic Dishonesty**

The instructor of this course will take appropriate actions in response to Academic Dishonesty, as defined the University’s Student Code. Acts of academic dishonesty include but are not limited to:

- **Cheating**: using, attempting to use, or providing others with any unauthorized assistance in taking quizzes, tests, examinations, or in any other academic exercise or activity. Unauthorized assistance includes:
  - Working in a group when the instructor has designated that the quiz, test, examination, or any other academic exercise or activity be done “individually;”
  - Depending on the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments;
  - Substituting for another student, or permitting another student to substitute for oneself, in taking an examination or preparing academic work;
  - Acquiring tests or other academic material belonging to a faculty member, staff member, or another student without express permission;
  - Continuing to write after time has been called on a quiz, test, examination, or any other academic exercise or activity;
  - Submitting substantially the same work for credit in more than one class, except with prior approval of the instructor; or engaging in any form of research fraud.

- **Falsification**: altering or fabricating any information or citation in an academic exercise or activity.

- **Plagiarism**: representing, by paraphrase or direct quotation, the published or unpublished work of another person as one’s own in any academic exercise or activity without full and clear acknowledgment. It also includes using materials prepared by another person or by an agency engaged in the sale of term papers or other academic materials.

For additional information go to: ARTICLE VI. University Regulations Regarding Academic Integrity (https://studentconduct.usu.edu/studentcode/article6)

**Sexual Harassment/Title IX**

Utah State University is committed to creating and maintaining an environment free from acts of sexual misconduct and discrimination and to fostering respect and dignity for all members of the USU community. Title IX and USU Policy 339 (http://www.usu.edu/policies/339) address sexual harassment in the workplace and academic setting.

The university responds promptly upon learning of any form of possible discrimination or sexual misconduct. Any individual may contact USU’s Office of Equity (https://equity.usu.edu/) for available options and resources or clarification. The university has established a complaint procedure to handle all types of discrimination complaints, including sexual harassment (USU Policy 305 (http://www.usu.edu/policies/305/)), and has designated the Office of Equity Director/Title IX Coordinator as the official responsible for receiving and investigating complaints of sexual harassment.

**Withdrawal Policy and "I" Grade Policy**
Students are required to complete all courses for which they are registered by the end of the semester. In some cases, a student may be unable to complete all of the coursework because of extenuating circumstances, but not due to poor performance or to retain financial aid. The term 'extenuating' circumstances includes: (1) incapacitating illness which prevents a student from attending classes for a minimum period of two weeks, (2) a death in the immediate family, (3) financial responsibilities requiring a student to alter a work schedule to secure employment, (4) change in work schedule as required by an employer, or (5) other emergencies deemed appropriate by the instructor.

**Students with Disabilities**

USU welcomes students with disabilities. If you have, or suspect you may have, a physical, mental health, or learning disability that may require accommodations in this course, please contact the Disability Resource Center (DRC) (http://www.usu.edu/drc/) as early in the semester as possible (University Inn # 101, (435) 797-2444, drc@usu.edu (mailto:drc@usu.edu)). All disability related accommodations must be approved by the DRC. Once approved, the DRC will coordinate with faculty to provide accommodations.

Students who are at a higher risk for complications from COVID-19 or who contract COVID-19 may also be eligible for accommodations.

**Diversity Statement**

Regardless of intent, careless or ill-informed remarks can be offensive and hurtful to others and detract from the learning climate. If you feel uncomfortable in a classroom due to offensive language or actions by an instructor or student(s) regarding ethnicity, gender, or sexual orientation, contact:

- Division of Student Affairs: https://studentaffairs.usu.edu (https://studentaffairs.usu.edu/), (435) 797-1712, studentservices@usu.edu (mailto:studentservices@usu.edu), TSC 220
- Student Legal Services: https://ususa.usu.edu/student-association/student-advocacy/legal-services (https://ususa.usu.edu/student-association/student-advocacy/legal-services), (435) 797-2912, TSC 326,
- Access and Diversity: http://accesscenter.usu.edu (http://accesscenter.usu.edu/), (435) 797-1728, access@usu.edu (mailto:access@usu.edu); TSC 315
- Multicultural Programs: http://accesscenter.usu.edu/multiculture (http://accesscenter.usu.edu/multiculture), (435) 797-1728, TSC 315
- LGBTQA Programs: http://accesscenter.usu.edu/lgbtqa (http://accesscenter.usu.edu/lgbtqa/), (435) 797-1728, TSC 3145
- Provost's Office Diversity Resources: https://www.usu.edu/provost/diversity (https://www.usu.edu/provost/diversity/), (435) 797-8176

You can learn about your student rights by visiting:

The Code of Policies and Procedures for Students at Utah State University: https://studentconduct.usu.edu/studentcode (https://studentconduct.usu.edu/studentcode/)

**Grievance Process**

Students who feel they have been unfairly treated may file a grievance through the channels and procedures described in the Student Code: Article VII (https://studentconduct.usu.edu/studentcode/article7).

**Full details for USU Academic Policies and Procedures can be found at:**

- Student Conduct (http://www.usu.edu/studentconduct)
- Student Code (https://studentconduct.usu.edu/studentcode/)
- Academic Integrity (https://studentconduct.usu.edu/studentcode/article6)
- USU Selected Academic Policies and Procedures (http://www.usu.edu/provost/faculty-life/syllabus.cfm)
Emergency Procedures

In the case of a drill or real emergency, classes will be notified to evacuate the building by the sound of the fire/emergency alarm system or by a building representative. In the event of a disaster that may interfere with either notification, evacuate as the situation dictates (i.e., in an earthquake when shaking ceases or immediately when a fire is discovered). Turn off computers and take any personal items with you. Elevators should not be used; instead, use the closest stairs.

Mental Health

Mental health is critically important for the success of USU students. As a student, you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce your ability to participate in daily activities. Utah State University provides free services for students to assist them with addressing these and other concerns. You can learn more about the broad range of confidential mental health services available on campus at Counseling and Psychological Services (CAPS) (https://counseling.usu.edu).

Students are also encouraged to download the “SafeUT App” (https://healthcare.utah.edu/uni/programs/safe-ut-smartphone-app) to their smartphones. The SafeUT application is a 24/7 statewide crisis text and tip service that provides real-time crisis intervention to students through texting and a confidential tip program that can help anyone with emotional crises, bullying, relationship problems, mental health, or suicide related issues.

Fees

Please note that the course fee is charged to cover the cost for replacement of lab materials and supplies, partial funding for TA support, and field trip supplies/transport.