Entomology – Biology 4415  
Spring, 2018  
Tentative Course Syllabus and Outline

Instructor: Dr. Rupesh Kariyat  
Office: SCIE 1.340  
Office hrs: MW from 2:30- 4:30 pm, or by appointment (preferred)  
Phone: (956) 665-2953  
E-mail: rupesh.kariyat@utrgv.edu  
Lab webpage: https://phenotype2017.wixsite.com/kariyatlab  
Lecture: MW from 8:00 – 9:15 am in SCIE 2.288  
Laboratory: Monday from 10:50am – 1:30 p.m. in SCIE 2.260

Course Objectives: This course is designed to provide students with fundamental knowledge of entomology and environmental interactions mediated by insects. The course will cover topics in the area of taxonomy and systematics of insects, insect morphology, anatomy, physiology and behavior. We will also examine the factors that allow insects to be highly successful on planet earth, and the ecological basis and impact of various pest management approaches to improve sustainable agriculture.

Textbooks:


Course Content and Requirements: Lecture will cover most of the material required for the class, and will include additional topics deemed to be relevant to the course objectives. The course will also have invited speakers who will lecture on a topic- usually from faculty or scientists who are experts in that area (E.g., Pest management). The course will also use live specimens, YouTube based video clips, online discussion forums with professional entomologists to make the lectures more interactive.

Laboratory: Lab sessions will focus on arthropod diversity, insect taxonomy, morphology, and anatomy. An insect collection consisting of a minimum of 50 specimens representing at least 10 insect orders is required for the course. Half of the collection will have to be submitted during
the week of the midterm exam, to ensure that the collection, labeling, and mounting is done accurately. **Collections will be graded on the basis of completeness, correct identification (to family level), correct labeling and overall neatness.** The students will be provided with all the materials needed for these collections (except the insects themselves), and the laboratory will be available for work on your collections. The collections, after grading will be added to our Entomology Museum, and will be used for teaching purposes in future versions of this course. In addition, there will also be a set of lab exercises focusing on insect-plant interactions, insect dissection, and estimating arthropod diversity.

**Expected Student Learning Outcomes:** The course has been designed to provide the student with a fundamental knowledge of 1) the phylogeny and systematics of insects and close relatives, 2) insect morphology, 3) insect physiology and behavior, and 4) the fundamentals of insect pest management and 5) factors affecting herbivory-pollinator interactions. Mastery of these topics will provide the student with the fundamental skills required of all professional entomologists.

**Exams and Grading Procedures:** Exams for the lecture portion of the course will include 3 regular lecture exams and a comprehensive final exam. Each of these exams will consist of a combination of multiple-choice, “fill-in-the-blank” and/or short essay-type questions on topics covered since the last exam (except the final, which will be comprehensive). In addition, there will be in class quizzes that will also contribute to the final grade. The laboratory grade will be based on the average of lab practical assignments, the required collection (midterm and final submission, and any additional assignments.

**Your final grade for the course will be calculated by averaging your scores for the lecture portion (50%) and the laboratory (50%),** and will be based on the following criteria:

A = 90-100; B = 80-89; C = 70-79; D = 60-69; F = <60

**Online references and resources of interest:**

https://www.youtube.com/watch?v=eqsXc_aefKI

http://entomology.si.edu/Collections.html

http://www.thedauphins.net/rgv_arthropods.html

**Students with Disabilities**

If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time.

**Brownsville Campus:** Student Accessibility Services is located in Cortez Hall Room 129 and
can be contacted by phone at (956) 882-7374 (Voice) or via email at accessibility@utrgv.edu.  

**Edinburg Campus:** Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at accessibility@utrgv.edu.

**Mandatory Course Evaluation Period**

Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account ([http://my.utrgv.edu](http://my.utrgv.edu)); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available: Nov 18 – Dec 8 for full fall semester courses.

**Attendance**

Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV’s attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

**Scholastic Integrity**

As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

**Sexual Harassment, Discrimination and Violence**

In accordance with UT System regulations, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at [www.utrgv.edu/equity](http://www.utrgv.edu/equity), including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

**Course Drops**

According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.
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<thead>
<tr>
<th>Date of Jan 17</th>
<th>Subject(s)</th>
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<tbody>
<tr>
<td></td>
<td>Why study insects?</td>
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<tr>
<td>24</td>
<td>History and Classification of Arthropoda</td>
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<td>31</td>
<td>Insect Morphology; Use of Dichotomous Keys</td>
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<td>Feb 7</td>
<td>Insect Classification: Apterygota &amp; Paleoptera</td>
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<td>14</td>
<td>Insect Classification: Neoptera - Exopterygota</td>
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<td>21</td>
<td><strong>EXAM I</strong></td>
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<td>28</td>
<td>Insect Classification: Neoptera - Endopterygota</td>
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<td>Mar 7</td>
<td>Insect Physiology: Integumentary, Digestive, Circulatory, Ventilatory &amp; Excretory Systems</td>
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<td><strong>SPRING BREAK</strong></td>
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<td>21</td>
<td>Insect Physiology: Nervous, Muscular, Glandular, Reproductive Systems; Sensory Mechanisms</td>
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<td><strong>EXAM II</strong></td>
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<td>Apr 4</td>
<td>Ecology and behavior, Social Insects</td>
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<td>11</td>
<td>Species interactions- Insects as pollinators</td>
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<td>Species interactions- Insects as herbivores and predators</td>
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<td><strong>EXAM III</strong></td>
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<td>May 2</td>
<td>Chemical ecology</td>
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<td>7</td>
<td>Principles of Integrated Pest Management</td>
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<td>May 14</td>
<td><strong>FINAL EXAM</strong> – Comprehensive</td>
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Lab schedule:

Week 1: No Labs (Wednesday)

Week 2: Introduction to the lab, insect collection, and collection awareness.
https://www.youtube.com/watch?v=Orq_YLN5FWE

How to pin?
https://www.youtube.com/watch?v=MT5VGlSCtg4

Week 3: Using insect collection to understand biodiversity

Lab Outline:
This lab is based on the paper published by Richardson and Hari on Teaching students about biodiversity by studying the correlation between plants and arthropods, The American Biology teacher, 70 (4): 217-220.

The goal of this lab is to train students about insect collection, and storage methods using inexpensive and easily available resources. In this lab, the students will split into groups and set up pitfall traps in low and high plant species rich areas, and examine the collection for two indices of biodiversity: species richness, and species abundance. The collected insects will be properly labeled, stored and identified, and be used to compile a data set exploring whether there is a correlation between plant species and insect diversity. The students will compile the data, analyze them, and present the results in the class the following week.

Week 4: Analysis and present data, and submit 1-2 page report on the data.

Week 5: Understanding the Life cycle of Manduca sexta

Week 6: Dissection exercise of mouth parts, digestive and nervous systems of M. sexta caterpillar
http://brainu.org/lesson/manduca-sexta-caterpillar-dissection

Week 7: Insect taxonomy – Insect orders Part 1
Week 8- Insect taxonomy- Part 2
Week 9- Insect taxonomy- Part 3
Week 10- Insect taxonomy- Part 4
Week 11: Field collection trip

http://entnemdept.ufl.edu/bug_club/ent-events/collecting101.shtml

Week 12: Identification of field collected insects

Week 13: Host plant specificity and co-evolution lab. 
*M. sexta and Solanum spp*


http://www.utrgv.edu/ce/programs/utrgv-stem/index.htm

Week 14: Plant volatiles collection and analyses

Plants produce a wide range of volatile compounds as a part of their regular metabolic activities. These compounds usually of low molecular weight and high vapor pressure are released into their environment from all parts of the plant. These volatiles are found to have multiple functions- floral scent serve as advertisement for pollinator attraction, herbivores such as caterpillar feeding induced volatiles attract predatory and parasitoid insects, thereby indirectly defending the plants. This lab is designed to investigate whether herbivory cause changes in plant volatile profile, and also to learn how to collect and quantify plant volatiles using a push pull system, and analyze volatile data and plot using standard statistics tools. The lab will be split into 2 weeks.

Week 14: Volatiles collection  
Week 15: Volatiles analysis  
Week 16: Exam, Collection submission