Entomology 689
2004

Basic Course Information

Instructor: Dr. S. Bradleigh Vinson, Professor
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Course: 689 3Hr (TBA)
Location: Heep Center – TBA
Title: Principals of Behavioral Ecology
Prerequisites: A course in Entomology
Co-requisites: None
Text: Not required, but helpful "Matthews, R. W. and J. R. Matthews 1978, **Insect Behavior**, John Wiley and Sons.

Course Description

The course will cover the basics of behavior focused on insects. Will include the types of input (Receptor organs involved), basic behavioral pathways, programming, integration, coordination and control of behavior. Methods used to study behavior. The rest of the course will examine the behavior of individuals, between individuals, and between species.

Course Summary

The course will examine the basic behavior of animals, but will focus on insects. Will begin with an introduction to behavior that will include reflex and repeated motor patterns, the organization of behavior and hierarchical patterns, and the role of the organism's physiological state on the pattern. This will be followed by the types of stimuli (vision, odors, sound, touch) and their perception. The course will next cover basic study methods followed by an examination of behaviors. These will begin with basic individual behavioral patterns (Ex. movement, feeding, breathing, molting, elimination, progeny production, nesting, dispersal), between individuals (Ex. communication, mating, competition, aggregation, rearing, social interactions), and between species (Ex. predation, parasitism, mutualism, defense, and disease).

Tests

3 tests will be combined with a term paper (see below) for the final grade (4 equal parts). Each test will only cover the new material provided up to the tests time.

Term paper

A term paper will be required on week 10 or its equivalent. A topic will be chosen by the student from a list provided by the instructor (by the end of the first week). The paper text will be 10- to 15 pages, double spaced 12pt. font, 1-in margins. In addition up to 1 page of references.

Grading

A= 80 - 100
B= 75 - 89
C= 61 - 74
D= 50 – 60
F= <50

Weekly outline (subject to TBA flexable schedule)::

Lectures are set up to be given 1 or 2 a day or 3 a week, but equivalent to the following:

Lecture

Week 1

1. **Introduction to Behavior.**
2. **Control of Behavior, neural, hormonal.**
3. **Control of Behavior triggers and interactions.**

Week 2

4. **Control of behavior reflex, repeated motor patterns.**
5. **Types of stimuli, sensory systems.**
6. **Methods to study behavior, recording.**

Week 3

7. **Characterization of stimuli.**
8. **The individual: Movement (active-passive, walking, flying, swimming).**
9. **Orientation (kinesis-taxis, factors and mechanisms).**

Week 4

10. **Dispersal.**
11. **Breathing, molting, elimination.**
12. **TEST 1**

Week 5

13. **Feeding (mechanisms, regulation, location, acceptance).**
14. **Feeding (strategies, maintenance, mechanisms).**
15. **Oviposition (location, acceptance, strategies)..**

Week 6

16. **Interacting individuals: Communication Chemical (odor, taste, release-receptors).**
17. **Communication Chemical (isolation, bioassays, identification)**
18. **Communication Visual (perception-production, patterns, signaling).**

Week 7

19. **Communication Sounds (perception-production, patterns)**
20. **Communication Sound (recording, bioassays, transmission).**
21. **Reproduction (mate location, courtship, mating).**

Week 8

22. **Reproduction (Dominance territoriality, competition, conflicts).**
23. **Aggregation, Nesting, Sociality (Types – Broad core, nesting, solitary-social)**
24. **Sociality (Organization, mechanisms)**

Week 9

25. **Sociality (integration and control).**
26. **TEST II**

27. Defense (strategies, Crypsis, mimicking, chemical, visual).

Week 10

28. Defense (single, groups)
29. Learning
30. Interacting species: types of interactions (predation, parasitism, mutualism).

Week 11

31. Host – prey location, host-prey recognition, host-prey defenses.
32. Mutualism (pollination).
33. Mutualism (dispersal).

Week 12

34. tritrophic interactions (plants).
35. Disease and host manipulation.
36. Analysis.

TEST III (On final time)